Evaluation of the Cost Impact of 2021 ICC Prescriptive Code Changes

RINKER-CR-2021-101

Final Report

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EXECUTIVE SUMMARY

The study examined the 2021 I-Codes changes (including: International Building Code (IBC); International Residential Code (IRC); International Mechanical Code; International Plumbing Code; International Fuel Gas Code; International Code for Existing Buildings; and National Electrical Code) and their cost impact on the 2018 I-Codes as incorporated in 2020 Florida Building Code (effective December 31, 2020).

The I-Codes 2021 changes that are prescriptive in nature and have the potential of changing the cost of construction were identified and used in a standard set of prototypes of two residential and five commercial/institutional building information models to determine the impact of these code changes on their construction costs. RS Means 2017 Cost data for the Orlando Region was used to price these prototype buildings. Model based quantities were used and verified along with some SF style estimates from RS means for certain systems that were not fully defined in the prototype building models. Based on these construction cost estimates, it was determined that the relative increase in cost due to the 2021 I-Codes changes ranged from approximately 0.02% for the Small Hotel prototype to approximately 1.32% for the Small Office building. The estimated relative change in cost for the residences was approximately 2.08% for the 1-story house to approximately 2.66% for the 2-story house. The average changes in cost were 0.47% for the commercial/institutional buildings and 2.37% for the residences.

Future research should focus on the use of the developed models and estimates to evaluate future code changes. In addition, workshop webinars should be promoted to introduce and encourage designers, builders and other code change petitioners to use the models to prospectively evaluate the cost impact of their proposed code changes. Finally, the modeling of other type of buildings should be explored to develop an even more diverse set of building models.

Overview

This research provides an assessment of the potential cost impacts of the 2021 I-Code changes to the 2018 International Building Codes as incorporated in 2021 Florida Building Code (effective December 31, 2020) by identifying those code changes/provisions that are prescriptive in nature and have the potential of adding cost to construction and by estimating the costs of the rest of the code changes using good engineering judgment and feedback from general contractors and consulting. A standard set of baseline residential and commercial building designs are modeled using building information modeling (BIM) and are used to produce cost estimates and extract the cost impact of code changes. Figure 1 shows the general process used to conduct this research.

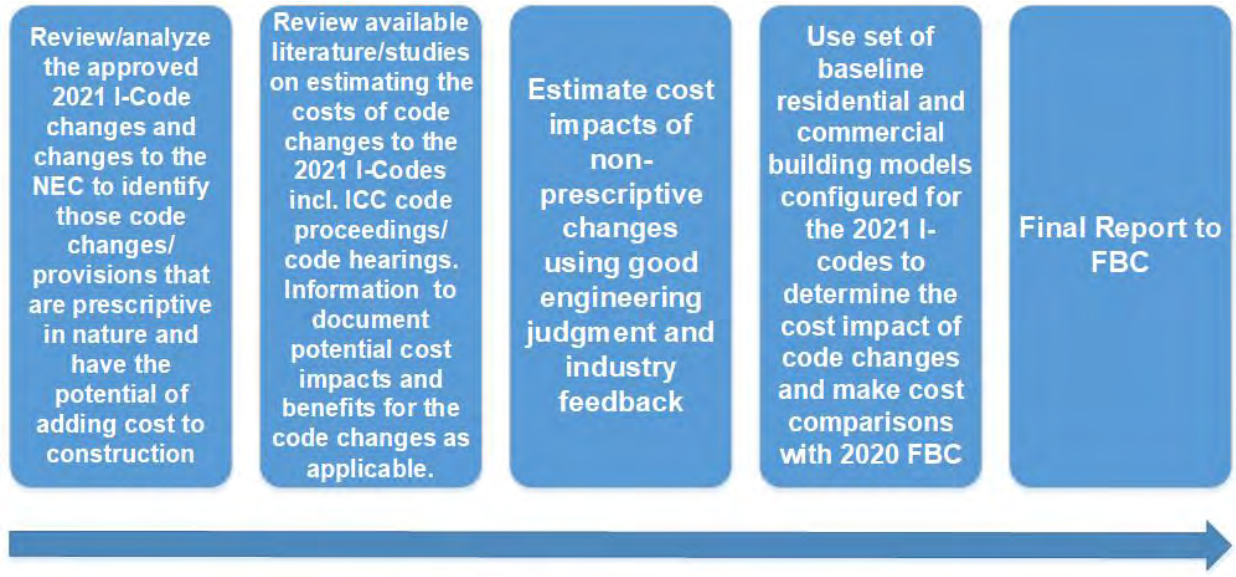

Figure 1. Research Plan

If any of the information gathered is seen as providing clear direction for one or more code recommendations, the recommendation(s) will also be written up and presented to the Commission. A preliminary report was submitted on 26 February 2021.

Scope of Work

Task

a. RS shall review/analyze the approved 2021 I-Code changes and changes to the NEC, as listed in Section 2, to identify those code changes/provisions that are prescriptive in nature and that have the potential of adding cost to construction.

b. The listed consultants shall participate in this process to assist the research team with the specifics of the design changes and their cost impacts as follows:

   - Koffel Associates shall conduct a review/analysis of non-structural fire protection and life safety requirements in IBC Chapter 3 through Chapter 10. This review shall be limited to applicable criteria affecting the five (5) different commercial building scenarios used for the 2018 I-Codes plus Florida Specific Changes (2020 FBC) (Reference – RINKER-CR-2016-101 Final Report). Koffel Associates shall also analyze means of egress and fire prevention for the one-story and two-story homes of the 2021 IRC. In addition, Koffel Associates shall provide the cost for the prescriptive code changes and their qualitative benefits.

   - AEI shall have primary responsibility in evaluating the applicable mechanical, electrical, and plumbing (MEP) related changes that have occurred between the 2018 and 2021 I-Codes, as they relate to the seven building types: 1) Small elementary school; 2) Stand-alone retail building; 3) Small hotel; 4) Small office building; 5) High-rise apartment; 6) one-story house on slab foundation; 7) 2-story house on slab foundation.

   - AEI shall also provide the cost for the prescriptive changes and their qualitative benefit.

c. RS shall review available literature/studies on the subject of estimating the costs of the changes to the 2021 I-Codes including the International Code Council's code proceedings/code hearing transcripts. Information gathered from this task shall be used to document potential cost impacts and benefits for the code changes identified in Item 4(a) and as applicable.

   - In addition to the ICC code proceedings/code hearing transcripts, cost databases such as RS's Means Cost Works, RS's Means Building Construction Cost Data, and AEI's and Koffel Associates' specific proprietary databases shall be used to estimate the potential cost impact of the applicable code changes.

d. RS shall estimate the construction cost impacts of those provisions that are not covered under Section 2 using good engineering judgment and feedback from general

contractors and consulting engineers. The listed consultants shall assist the research team with the cost estimates for these changes.

e. RS shall use the set of baseline residential and commercial building designs configured for the 2021 I-codes to determine the cost impact of code changes. RS shall configure these buildings using the buildings listed below which were used to estimate the cost impacts of the 2018 I-Code changes and Florida-specific amendments to the Florida Building Code, 6th Edition, (2017):

   - For the purposes of this study the seven buildings include five commercial buildings: 1) Small elementary school; 2) Stand-alone retail building; 3) Small hotel; 4) Small office building; 5) High-rise apartment 6) one-story house on slab foundation; (7) 2 story house on slab foundation.

f. RS shall use building information modeling (BIM) tools developed for the 2018 I-Codes (as amended via the Florida Building Code, 7th Edition (2020) and 2021 I-Codes) to produce:

   - A schedule of material quantities (exported to MS Excel).
   - Architectural 3D view and walk-through.
   - Isolated structural 3D view and walk-through.
   - Isolated mechanical, electrical, and plumbing (MEP)/mechanical, electrical, plumbing, and fire (MEPF) 3D view and walk-through.

g. RS shall use the information developed by Item 4(f) and cost databases to produce cost estimates and extract cost impact of changes on the reference houses and commercial buildings. Sources of cost data shall include RS Means Cost Data, distributors' or big box retailers' websites, and building contractors. Cost estimates of the code changes that do not directly apply to the selected reference houses shall be listed separately and shall be added or subtracted from the aggregated costs for these reference houses.

MEP Code Changes Cost Impact

Affiliated Engineers SE Inc. (AEI) has undertaken a study aimed at evaluating the cost impact that will result from the state of Florida's adoption of the 2021 Edition of the I-Codes. AEI's primary responsibility resided in evaluating the applicable MEP related changes that have occurred between the 2018 Edition and the 2021 Edition of the I-Codes and their cost impact and benefit.

Mechanical and Plumbing Changes Cost Impact

Findings

1. A significant proportion of code changes across all I-Codes offer revised language for clarity and consistency.
2. The IMC featured several code changes whereby product standards tables have been updated to reflect those most current.
3. Overall trends in the commercial sector point towards the specification of mechanical equipment with more superior efficiency ratings, the addition of control points and/or revision of sequences and the further clarification of existing code language.

The supporting appendices Tables 1 - 7 (APPENDIX A - G) provide further detail and elaboration on the above-listed key observations.

NEC Changes Cost Impact

A review of the changes to the 2020 National Electric Code (NEC) was completed by examining each change and the corresponding committee notes. Where the changes were deemed to have a cost impact on construction a value was determined by considering the change between the 2020 and 2017 code versions. Material price differentials were based on retail prices and the wages were based on the prevailing wage reports of the U.S. Department of Labor.

Findings

Many of the changes to the code were due to editorial changes to improve readability and style consistency. Many others were made so that the NEC rules align with other codes and standards. Some of changes impacted large portions of the code. These include:

- NEC now covers the export of power from electric vehicles to premises wiring to permit bi-directional power flow between electric vehicles and premises wiring.
- Exterior emergency disconnects to improve safety for one and two family dwellings.
- Updated load calculation methods to reflect changes in energy efficiency
- Requires surge protective devices for all dwellings.
- Expanded the usage of GFCIs

Four new articles were introduced to adjust to current trends. Although these will help to improve safety, a cost assessment was difficult to ascertain.

- 242 - Overvoltage Protection
    - Relocates Articles 280 and 285 into new Article 242 to improve usability of the code.
- 311 - Medium Voltage Conductors and Cables
    - Consolidation of the medium voltage requirements of Articles 310 and 328 into new Article 311 to improve usability of the code.
- 337 - Type P Cable
    - Type P cable is a marine shipboard cable suitable for petrochemical applications due to its flexibility and rugged construction.

- 805 – Communication Circuits
    - Combine common elements of 800, 820, 840, and 840 into a new general article.

Table 8 (APPENDIX H) provides further detail and elaboration on the cost impact observations.

International Building Code (IBC-FPC) Changes Cost Impact

Koffel Associates, Inc. has undertaken a study aimed at evaluating the cost impact that will result from the state of Florida's adoption of the 2021 Edition of the International Building Code (IBC).

Findings

Note that all code requirements that have been added associated with heavy timber requirements are noted as no cost impact, as those requirements did not previously exist to compare against. Depending on the use of heavy timber construction, this may increase or decrease cost.

For the IBC changes that reference other ICC codes or NFPA 1, 70, or 101, a cursory review of the respective ICC Code, or the aforementioned NFPA Code or Standard section that is referenced by the IBC change was reviewed for the degree to which it affects the cost impact to the five buildings considered as part of this study. Such referenced Code and Standard changes imposing a significant cost impact are included in summary Table 9 (APPENDIX I).

Structural Code Changes Cost Impact

The RS has undertaken a study aimed at evaluating the cost impact that will result from the state of Florida's adoption of the 2021 Edition of the International Building Code (IBC). RS took primary responsibility in evaluating the applicable Structural Engineering related changes that have occurred between the 2018 Edition and the 2021 Edition of the IBC and IRC.

Findings

There were very few prescriptive cost impact changes and many were related to seismic requirements.

Tables 10-11 (Appendix J - K) provide further detail and elaboration on the above-listed key observations.

Building Information Models and Associated Cost Impacts

A comparison of the cost impact of changing from the 2017 FBC to 2021 I-Codes is shown in Table 1. The cost impact of the 2021 ICC code changes ranged from approximately 7.78% for the Retail building to approximately 44.47% for the 2-story residence building with an average of 16.37% for the commercial/institutional buildings and an average of 42.62% for the residences.

Table 2 is a comparison of the cost impact of changing from the 2018 to the 2021 I-Codes. The cost impact of the 2021 ICC code changes ranged from approximately 0.02% for the Small Hotel to approximately 4.28% for Retail building with an average of 1.24% for the commercial/institutional buildings and an average of 2.37% for the residences. Each building type is discussed, and the changes modeled are listed in the subsequent subsections based on Levels 1 and 2 of the ASTM Uniformat II Standard E1557 associated with each building type (See Figure 3). The ASTM E1557 standard provides a common structure linking the building program, specifications, and estimates.

Table 1. Summary I-Codes Changes Cost Impact Comparison

	Building Type	Estimated Cost Under *2017 FBC*	Estimated Cost Under *2021 I-Codes*	Anticipated Cost Change
1	*Small Office*	$ 11,377,503	$ 12,653,285	11.21%
2	*Retail Spaces*	$ 24,098,747	$ 25,973,932	7.78%
3	*Primary School*	$ 8,428,550	$ 9,489,444	12.59%
4	*Small Hotel*	$ 7,859,380	$ 9,024,994	14.83%
5	*Mid-Rise Apartment*	$ 40,111,832	$ 52,658,039	31.28%
6	*1 Story Residence*	$ 223,324	$ 314,356	40.76%
7	*2 Story Residence*	$ 324,066	$ 468,180	44.47%
	Average Net % Change in Cost Estimate (Entire Sample):			23.87%

Table 2. Summary I-Codes Changes Cost Impact Comparison

	Building Type	*Estimated Cost Under 2018 I-Codes*	*Estimated Cost Under 2021 I-Codes*	Anticipated Cost Change
1	*Small Office*	$ 12,488,293	$ 12,653,285	1.32%
2	*Retail Spaces*	$ 25,867,734	$ 25,973,932	0.41%
3	*Primary School*	$ 9,485,575	$ 9,489,444	0.04%
4	*Small Hotel*	$ 9,023,628	$ 9,024,994	0.02%
5	*Mid-Rise Apartment*	$ 52,369,151	$ 52,658,039	0.55%
6	*1 Story Residence*	$ 307,960	$ 314,356	2.08%
7	*2 Story Residence*	$ 456,065	$ 468,180	2.66%
	Average Net % Change in Cost Estimate (Entire Sample):			1.56%

Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements
A. SUBSTRUCTURE	A10 Foundations	A1010 Standard Foundations A1020 Special Foundations A1030 Slab on Grade
	A20 Basement Construction	A2010 Basement Excavation A2020 Basement Walls
B. SHELL	B10 Superstructure	B1010 Floor Construction B1020 Roof Construction
	B20 Exterior Closure	B2010 Exterior Walls B2020 Exterior Windows Exterior Doors
	B30 Roofing	B3010 Roof Coverings B3020 Roof Openings
C. INTERIORS	C10 Interior Construction	C1010 Partitions C1020 Interior Doors C1030 Specialties
	C20 Staircases	C2010 Stair Construction C2020 Stair Finishes
	C30 Interior Finishes	C3010 Wall Finishes C3020 Floor Finishes C3030 Ceiling Finishes
D. SERVICES	D10 Conveying Systems	D1010 Elevators D1020 Escalators & Moving Walks D1030 Material Handling Systems
	D20 Plumbing	D2010 Plumbing Fixtures D2020 Domestic Water Distribution D2030 Sanitary Waste D2040 Rain Water Drainage D2050 Special Plumbing Systems
	D30 HVAC	D3010 Energy Supply D3020 Heat Generating Systems D3030 Cooling Generating Systems D3040 Distribution Systems D3050 Terminal & Package Units D3060 Controls & Instrumentation D3070 Special HVAC Systems & Equipment D3080 Systems Testing & Balancing
	D40 Fire Protection	D4010 Fire Protection Sprinkler Systems D4020 Stand-Pipe & Hose Systems D4030 Fire Protection Specialties D4040 Special Electrical Systems
	D50 Electrical	D5010 Electrical Service & Distribution D5020 Lighting & Branch Wiring D5030 Communication & Security Systems D5040 Special Electrical Systems
E. EQUIPMENT & FURNISHINGS	E10 Equipment	E1010 Commercial Equipment E1020 Institutional Equipment E1030 Vehicular Equipment E1040 Other Equipment
	E20 Furnishings	E2010 Fixed Furnishings E2020 Movable Furnishings
F. SPECIAL CONSTRUCTION & DEMOLITION	F10 Special Construction	F1010 Special Structures F1020 Integrated Construction F1030 Special Construction Systems F1040 Special Facilities F1050 Special Controls & Instrumentation
	F20 Selective Building Demolition	F2010 Building Elements Demolition F2020 Hazardous Components Abatement

Figure 3. ASTM UNIFORMAT II Classification of Building Elements (E 1557)

Small Office Building

The design for the permitted drawings for this 7-story office building were for the shell only, and the interior floor build outs were left for future tenants. In this regard, additional costs implications may be realized once the building is designed to completion by tenants. The 2021 ICC changes were evaluated based solely on the approved shell and infrastructure drawings. A typical small office building model is shown in Figures A-1 through A-3. The 2021 ICC changes, changes mostly impacted the Services level of the prepared cost estimate. The HVAC, fire protection and electrical systems all showed an increase in cost.

Two 2021 I-Codes changes drove the majority of the cost increase. The first major contributor to the cost increase was due to change in Fire Protection and Life Safety F110-18 which removed open parking garages from being exempt from sprinkler systems. The second contributor to the cost increase was due to the 2021 IBC E27-18 change, which required more lighting in staircases used as means of egress.

Table A. Small Office Estimated Cost Summary

	ASTM Uniformat II Levels	*2017 FBC Costs*	*2018 I-Codes Costs*	*2021 I-Codes Costs*
1	***Substructure***	**$321,690**	**$321,690**	**$321,690**
	A10 -Foundations	$321,690	$321,690	$321,690
	A20 -Basement	$-	$-	$-
2	***Shell***	**$4,773,816**	**$4,773,816**	**$4,773,816**
	B10 -Superstructure	$2,914,531	$2,914,531	$2,914,531
	B20 -Ext. Enclosure	$1,825,177	$1,825,177	$1,825,177
	B30 - Roofing	$34,108	$34,108	$34,108
3	***Interiors***	**$1,089,086**	**$1,089,086**	**$1,089,086**
	C10 - Int. Construction	$308,211	$308,211	$308,211
	C20 - Stairs	$199,908	$199,908	$199,908
	C30 – Int. Finishes	$580,966	$580,966	$580,966
4	***Services***	**$5,192,911**	**$6,303,701**	**$6,468,693**
	D10 - Conveying	$728,036	$728,036	$728,036
	D20 - Plumbing	$302,556	$315,775	$315,775
	D30 - HVAC	$126,474	$425,994	$425,994
	D40 - Fire Protection	$1,873,315	$1,898,784	$2,061,751
	D50 - Electrical	$2,162,531	$2,935,112	$2,937,137
5	***Equip. & Furnishings***	$-	$-	$-
6	***Special Construction***	$-	$-	$-
7	***Building Sitework***	$-	$-	$-
	Total Cost	**$11,377,503**	**$12,488,293**	**$12,653,285**
	Change from Previous		9.76%	1.32%
	Change from 2017 FBC		9.76%	11.21%

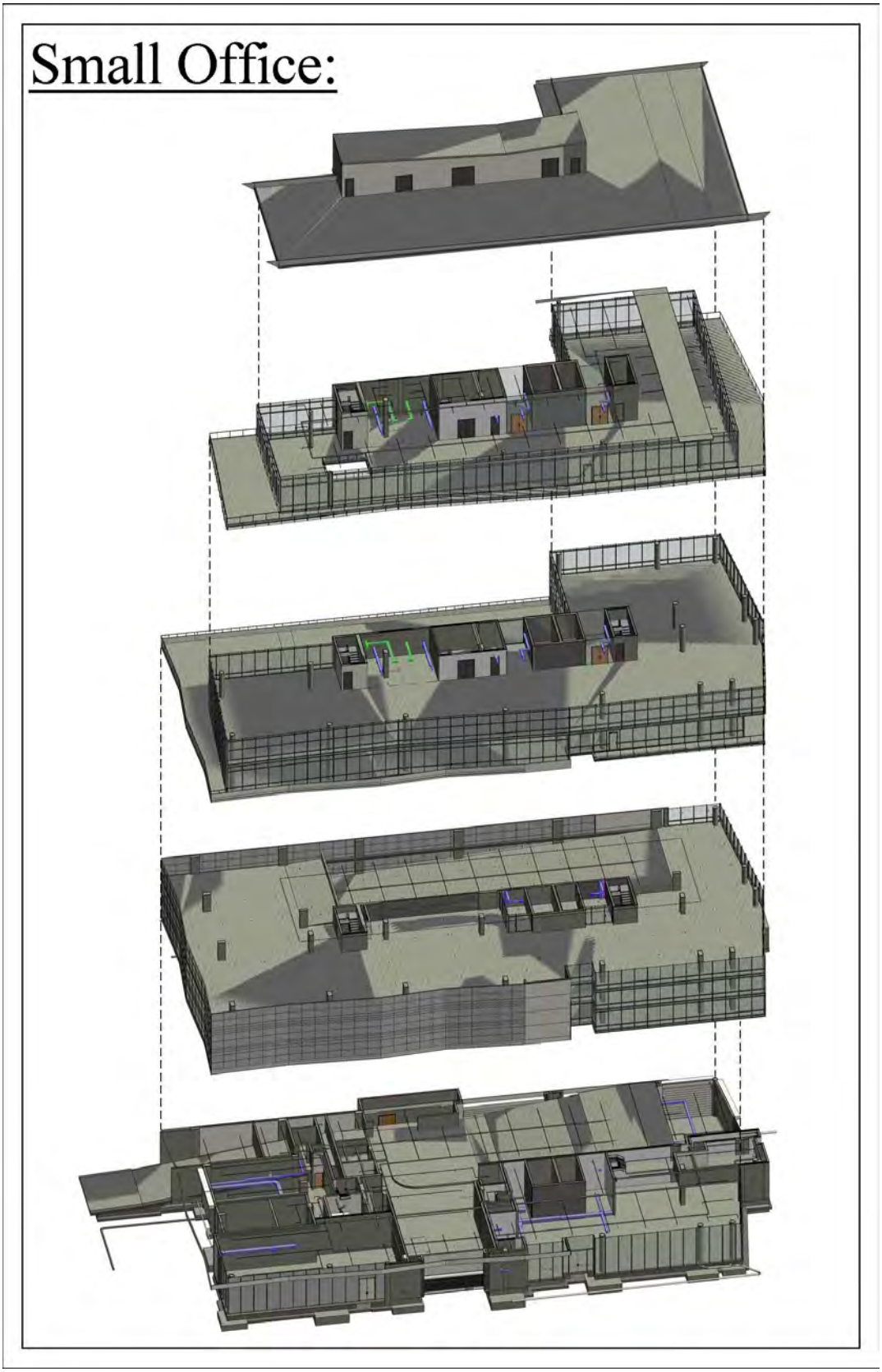

Figure A-1. 3D sections of Small Office Building

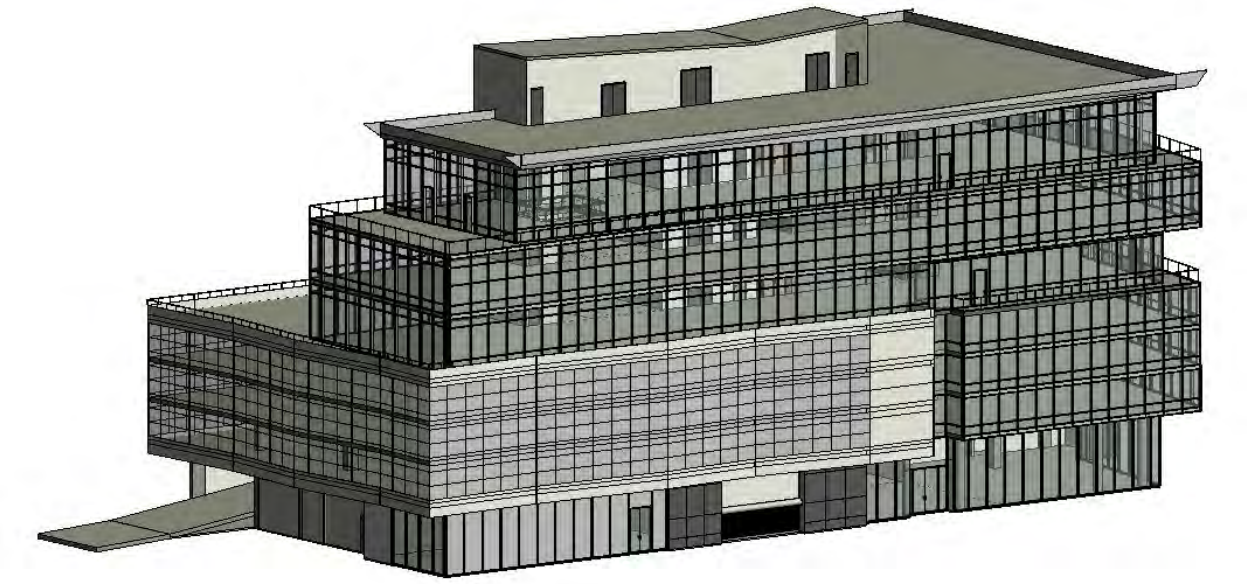

Figure A-2. 3D Model of Small Office Building

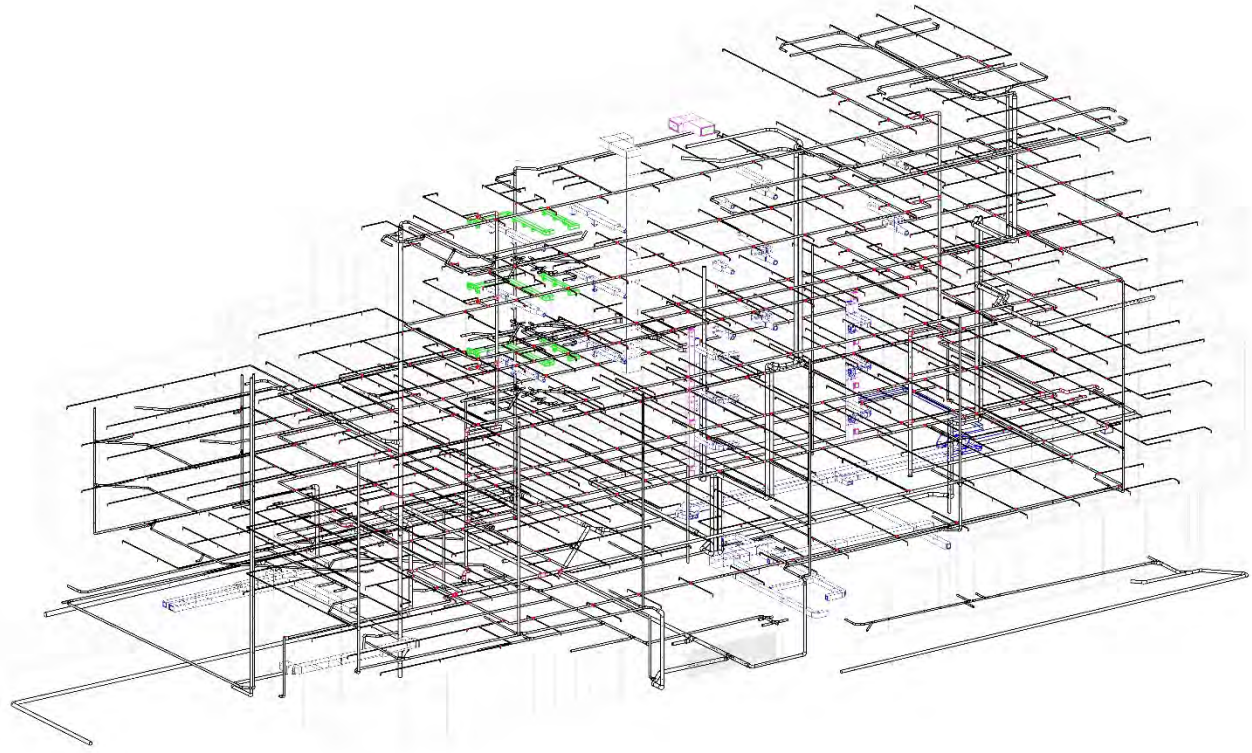

Figure A-3. 3D Model of MEP systems for Small Office Building

Retail Spaces

Typical retail spaces are shown in Figures B-1 through B-3. The retail spaces modeled and utilized to develop this estimate have a parking structure on the lower level with large open areas above, from which the retail spaces can be accessed. It is an "open-air" style retail plaza and the retail spaces themselves are to be built out by the tenants. Due to this, major utility connections were made available in the approved drawings but there were limited MEP finishes as it was assumed that the tenants would complete this work and get it approved separately. The 2021 I-Codes changes were applied to the drawing set for the main retail space and the tenant built-outs were not evaluated. The HVAC, fire protection and electrical systems all showed an increase in cost.

Two 2021 I-Codes changes drove the majority of the cost increase. The first major contributor to the cost increase was due to change in Fire Protection and Life Safety F110-18 which removed open parking garages from being exempt from sprinkler systems. The second contributor to the cost increase was due to the 2021 IBC E27-18 change, which required more lighting in staircases used as means of egress.

Table B. Retail Estimated Cost Summary

	ASTM Uniformat II Levels	*2017 FBC Costs*	*2018 I-Codes Costs*	*2021 I-Codes Costs*
1	***Substructure***	**$2,558,734**	**$2,558,734**	**$2,558,734**
	A10 -Foundations	$2,558,734	$2,558,734	$2,558,734
	A20 -Basement	$-	$-	$-
2	***Shell***	**$10,912,190**	**$10,912,190**	**$10,912,190**
	B10 -Superstructure	$9,041,350	$9,041,350	$9,041,350
	B20 -Ext. Enclosure	$1,785,557	$1,785,557	$1,785,557
	B30 - Roofing	$85,283	$85,283	$85,283
3	***Interiors***	**$1,424,925**	**$1,424,925**	**$1,424,925**
	C10 - Int. Construction	$411,821	$411,821	$411,821
	C20 - Stairs	$443,168	$443,168	$443,168
	C30 – Int. Finishes	$569,936	$569,936	$569,936
4	***Services***	**$9,202,899**	**$10,971,886**	**$11,078,084**
	D10 - Conveying	$853,948	$853,948	$853,948
	D20 - Plumbing	$984,458	$1,035,479	$1,035,479
	D30 - HVAC	$775,121	$1,290,674	$1,290,674
	D40 - Fire Protection	$5,992,616	$6,089,021	$6,191,696
	D50 - Electrical	$596,756	$1,702,764	$1,706,287
5	***Equip. & Furnishings***	$-	$-	$-
6	***Special Construction***	$-	$-	$-
7	***Building Sitework***	$-	$-	$-
	Total Cost	**$24,098,747**	**$25,867,734**	**$25,973,932**
	Change from Previous		7.34%	0.41%
	Change from 2017 FB		7.34%	7.78%

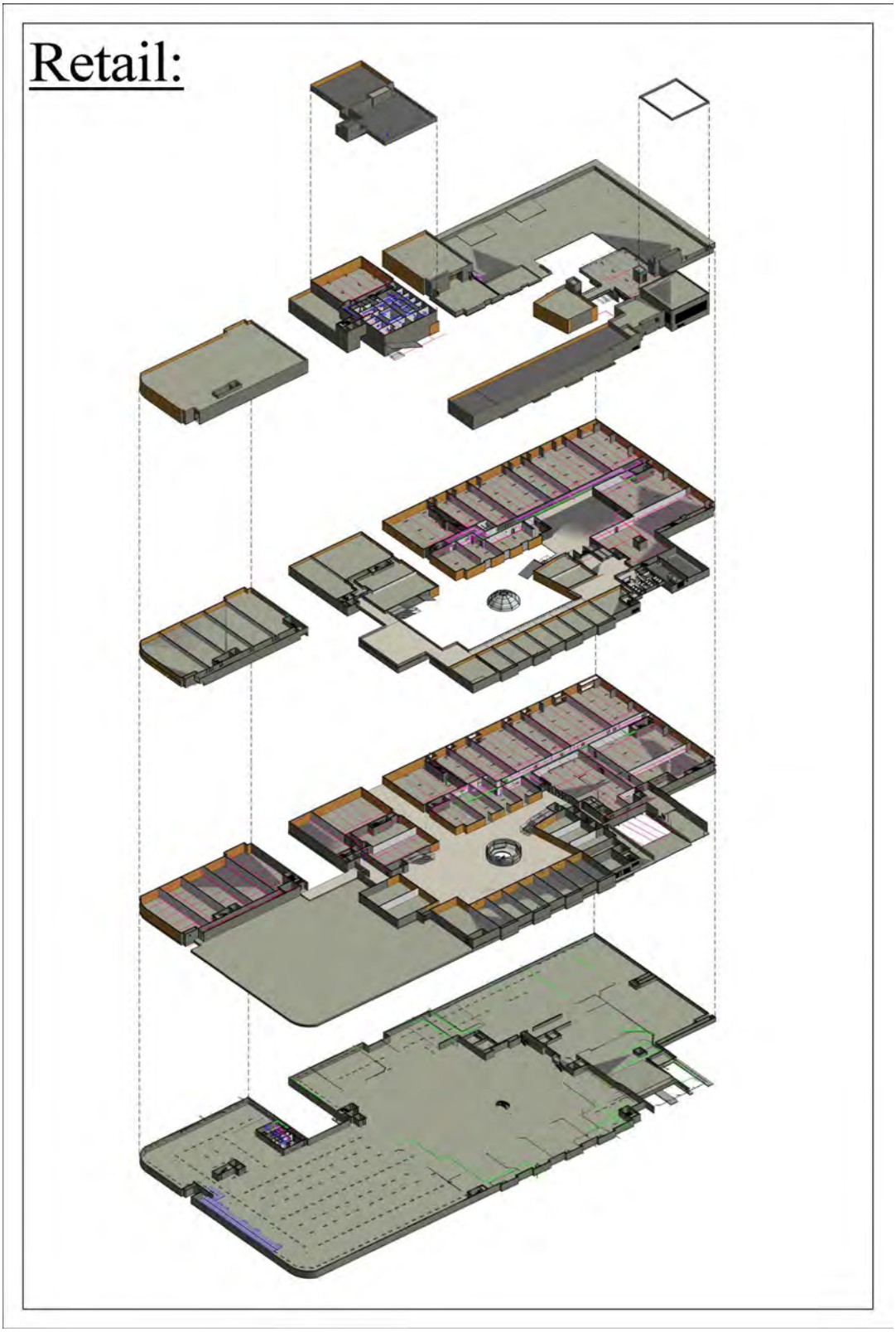

Figure B-1. 3D sections of Retail Space

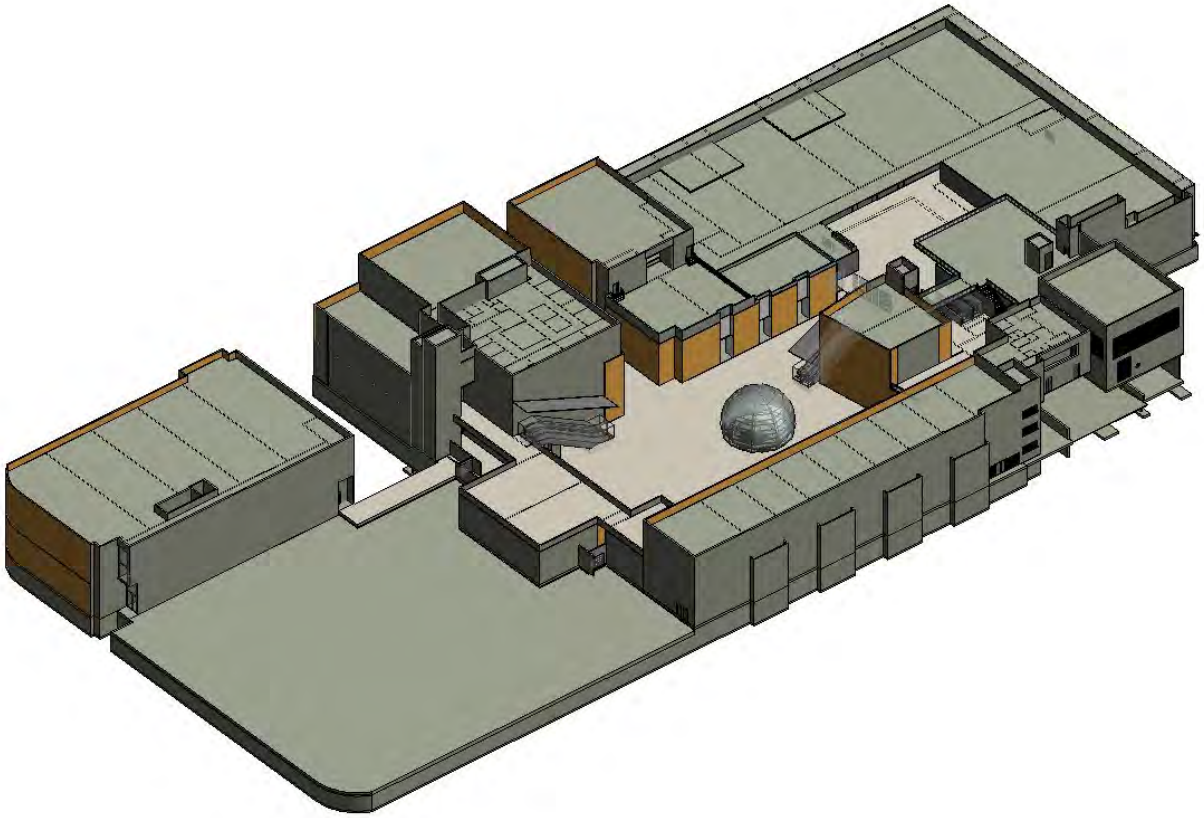

Figure B-2. 3D model of Retail Spaces

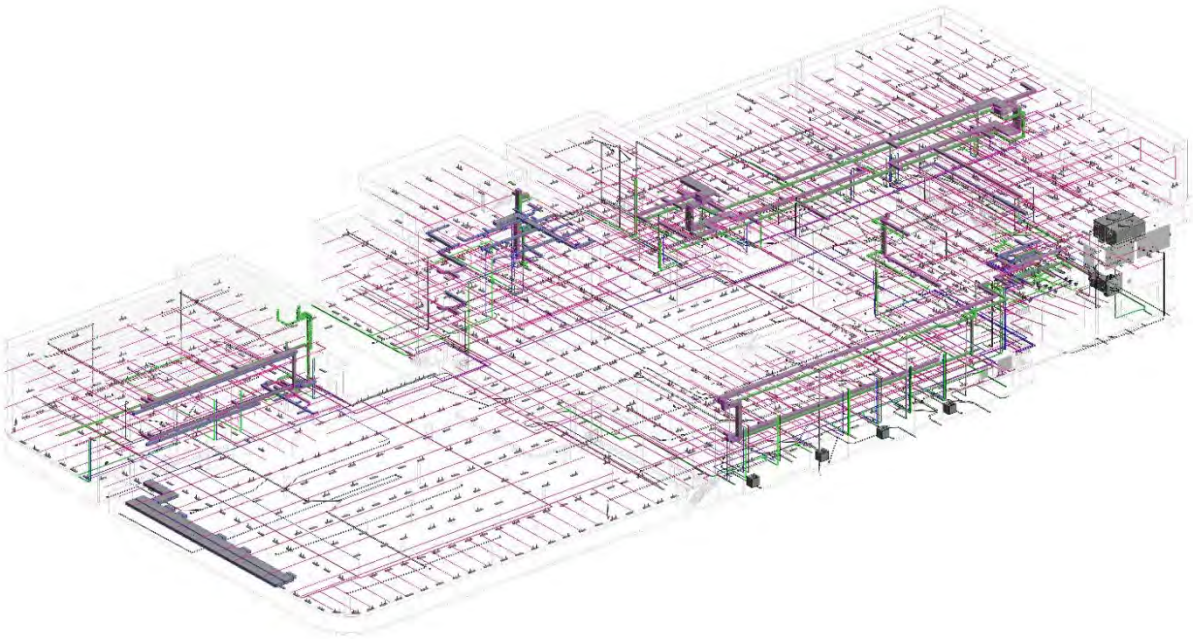

Figure B-3. 3D Model of MEP systems for Retail Spaces

Elementary School

As shown in Figures C-1 through C-3, the elementary school building has two levels in the classroom areas and one level near the cafeteria and auditorium spaces. The building is a public school with largely standard materials and was designed with performance and longevity in mind. The 2021 ICC changes mostly impacted the Services level of the prepared cost estimate. The plumbing, HVAC, fire protection and electrical systems all showed an increase in cost.

One contributor to the cost increase found in the 2021 I-Codes changes was due to Fire Protection and Life Safety change FS8-18 requires additional 12-in. fire protection to structural members attachments. Additional cost increases were determined due to the 2021 IBC E27-18 change, which required more lighting in staircases used as means of egress.

Table C. Elementary School Estimated Cost Summary

	ASTM Uniformat II Levels	*2017 FBC Costs*	*2018 I-Codes Costs*	*2021 I-Codes Costs*
1	***Substructure***	**$743,241**	**$743,241**	**$743,241**
	A10 -Foundations	$743,241	$743,241	$743,241
	A20 -Basement	$-	$-	$-
2	***Shell***	**$3,737,916**	**$3,737,916**	**$3,737,916**
	B10 -Superstructure	$1,636,810	$1,636,810	$1,636,810
	B20 -Ext. Enclosure	$1,260,650	$1,260,650	$1,260,650
	B30 - Roofing	$840,456	$840,456	$840,456
3	***Interiors***	**$1,276,392**	**$1,276,392**	**$1,276,392**
	C10 - Int. Construction	$584,401	$584,401	$584,401
	C20 - Stairs	$79,310	$79,310	$79,310
	C30 – Int. Finishes	$612,681	$612,681	$612,681
4	***Services***	**$2,671,000**	**$3,728,026**	**$3,731,895**
	D10 - Conveying	$64,985	$64,985	$64,985
	D20 - Plumbing	$634,069	$662,335	$662,485
	D30 - HVAC	$663,725	$1,259,022	$1,259,022
	D40 - Fire Protection	$612,906	$637,293	$638,761
	D50 - Electrical	$695,316	$1,104,391	$1,106,642
5	***Equip. & Furnishings***	$-	$-	$-
6	***Special Construction***	$-	$-	$-
7	***Building Sitework***	$-	$-	$-
	Total Cost	**$8,428,550**	**$9,485,575**	**$9,489,444**
	Change from Previous		12.54%	0.04%
	Change from 2017 FBC		12.54%	12.59%

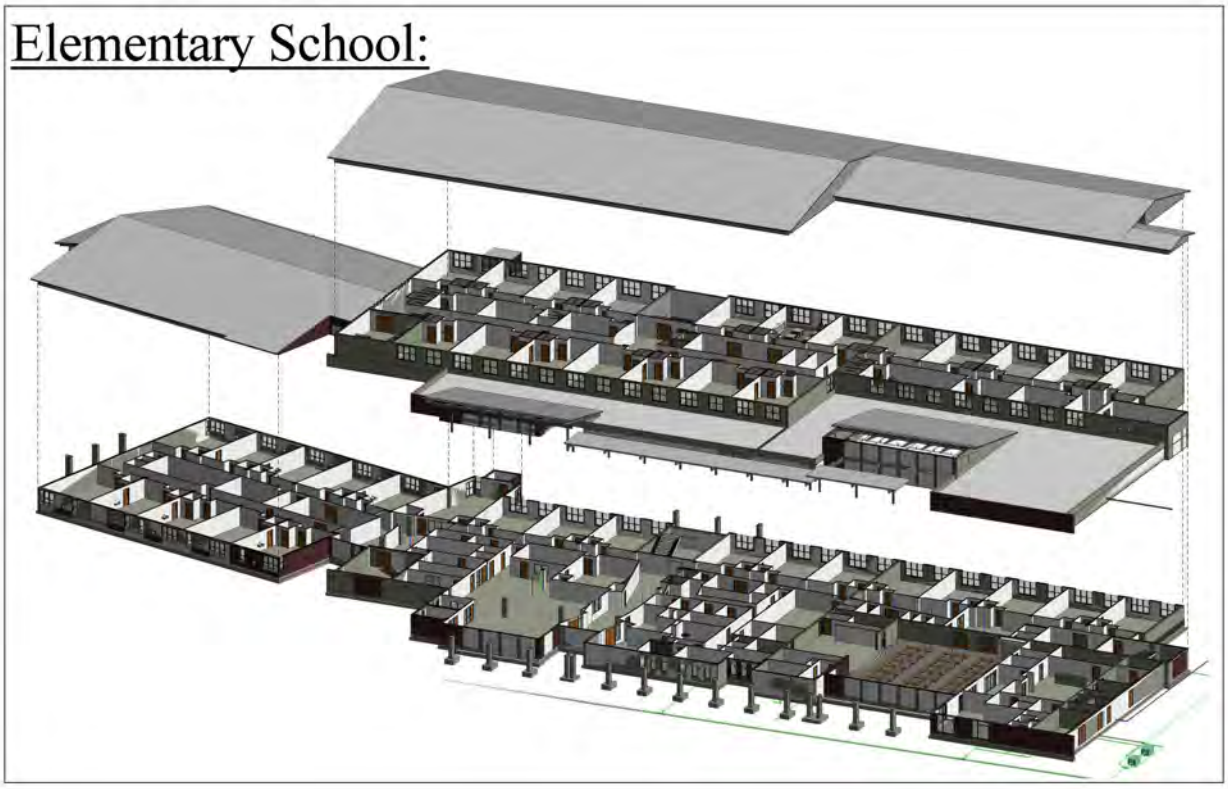

Figure C-1. 3D sections of Elementary School

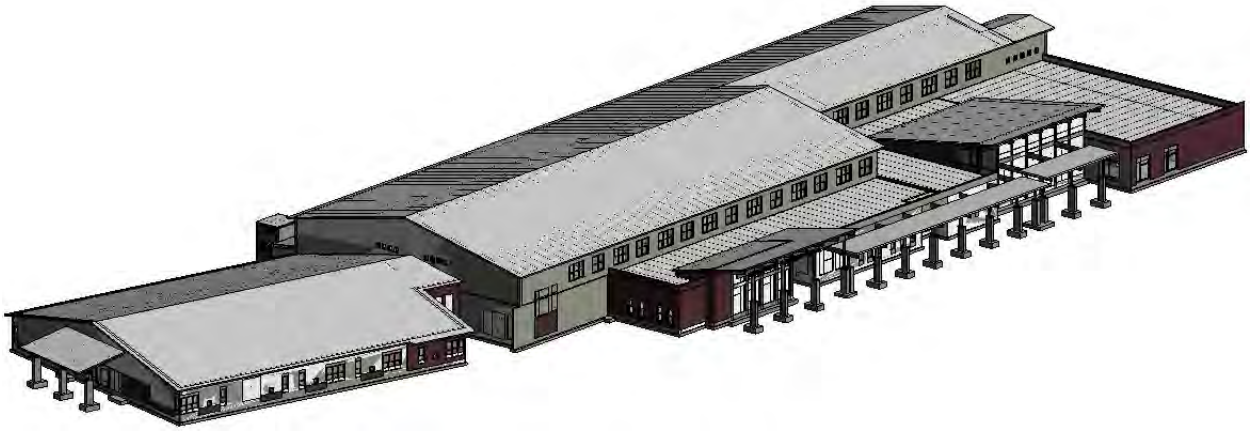

Figure C-2. 3D model of Elementary School

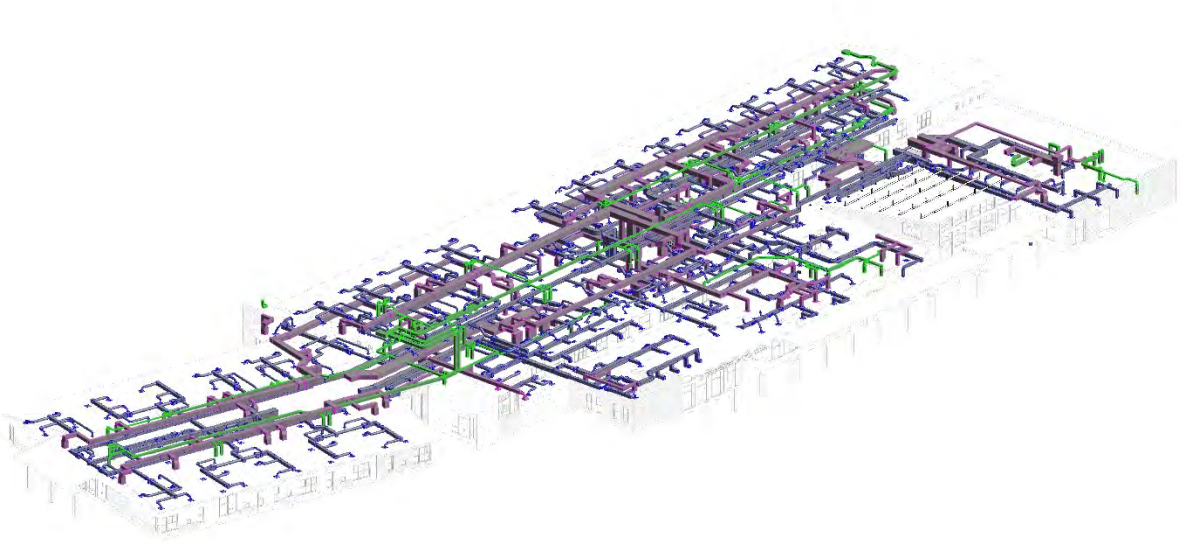

Figure C-3. 3D model of MEP systems for Elementary School

Small Hotel

As shown in Figures D-1 through D-3, the hotel modeled for this estimate is a 3-story building with 128 hotel rooms, a full service kitchen and lobby area with standard hotel amenities. Each room has its own dedicated package HVAC unit and exhaust system. Both the exterior enclosure and interior partitions are primarily CMU structure walls with stucco or gypsum finish respectively. The 2021 ICC changes mostly impacted the Services level of the prepared cost estimate. The plumbing, HVAC, fire protection and electrical systems all showed an increase in cost.

One contributor to the cost increase found in the 2021 I-Codes changes was due to Fire Protection and Life Safety change FS8-18 which requires additional 12-in. fire protection to structural members attachments. Additional cost increases were determined due to the 2021 IBC E27-18 change, which required more lighting in staircases used as means of egress. Changes to the 2021 National Electrical code require additional GFCI for laundry rooms of non-dwellings (FR-8126) and for locations within 6 feet of a bathtub or shower in a non-dwelling (FR-8127). Moreover, changes to FR-8546 require additional surge protection to dwelling unit services.

Table D. Small Hotel Estimated Cost Summary

	ASTM Uniformat II Levels	*2017 FBC Costs*	*2018 I-Codes Costs*	*2021 I-Codes Costs*
1	***Substructure***	**$278,388**	**$278,388**	**$278,388**
	A10 -Foundations	$278,388	$278,388	$278,388
	A20 -Basement	$-	$-	$-
2	***Shell***	**$1,987,358**	**$1,987,358**	**$1,987,358**
	B10 -Superstructure	$1,098,060	$1,098,060	$1,098,060
	B20 -Ext. Enclosure	$816,307	$816,307	$816,307
	B30 - Roofing	$72,991	$72,991	$72,991
3	***Interiors***	**$1,416,588**	**$1,416,588**	**$1,416,588**
	C10 - Int. Construction	$802,456	$802,456	$802,456
	C20 - Stairs	$64,134	$64,134	$64,134
	C30 – Int. Finishes	$549,998	$549,998	$549,998
4	***Services***	**$4,177,046**	**$5,326,293**	**$5,327,659**
	D10 - Conveying	$165,710	$165,710	$165,710
	D20 - Plumbing	$624,368	$658,942	$658,942
	D30 - HVAC	$1,322,484	$1,791,139	$1,791,139
	D40 - Fire Protection	$870,972	$901,944	$902,276
	D50 - Electrical	$1,193,512	$1,808,558	$1,809,592
5	***Equip. & Furnishings***	$-	$15,000	$15,000
6	***Special Construction***	$-	$-	$-
7	***Building Sitework***	$-	$-	$-
	Total Cost	**$7,859,380**	**$9,023,628**	**$9,024,994**
	Change from Previous		14.81%	0.02%
	Change from 2017 FBC		14.81%	14.83%

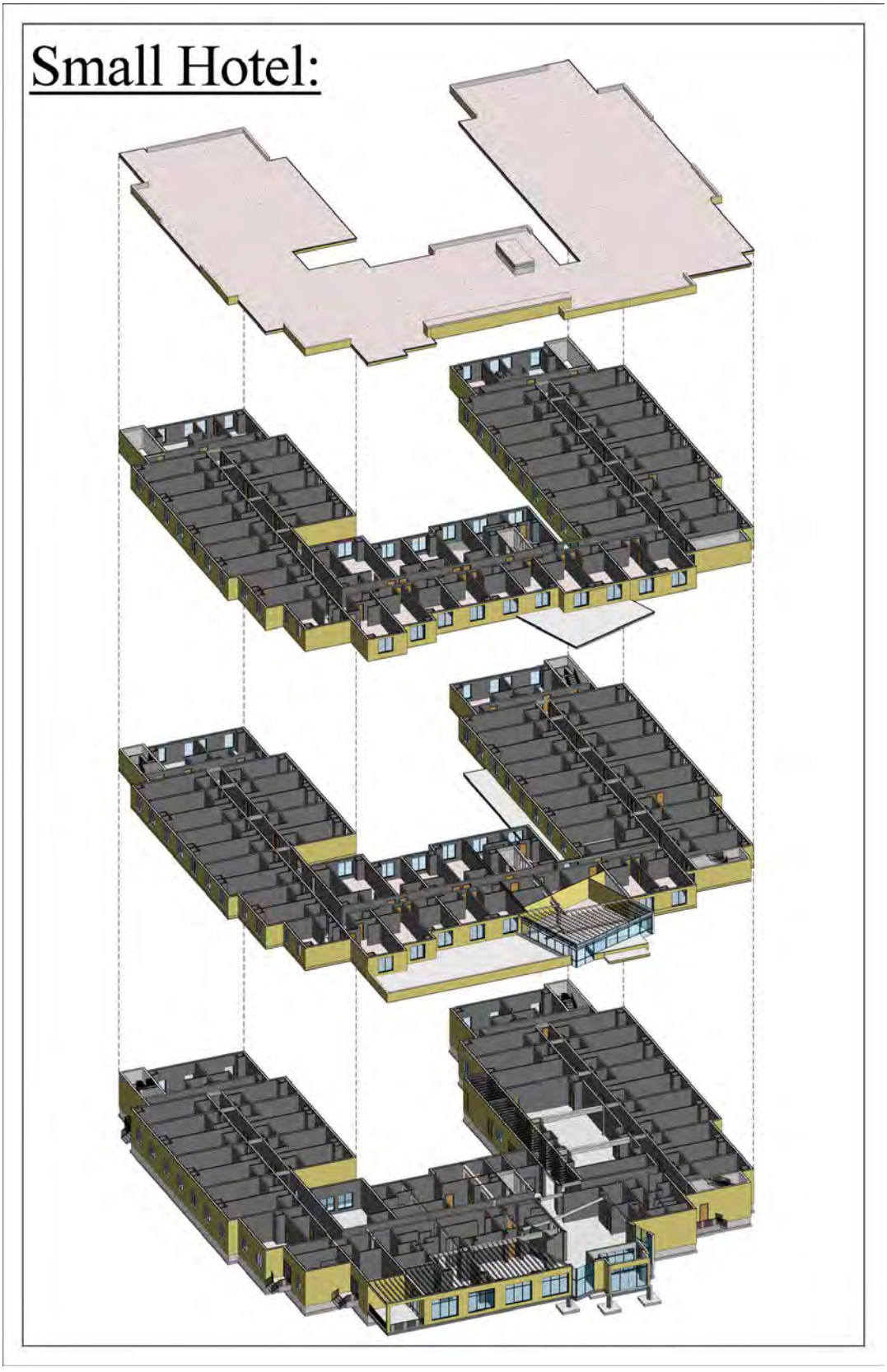

Figure D-1. 3D sections of Small Hotel

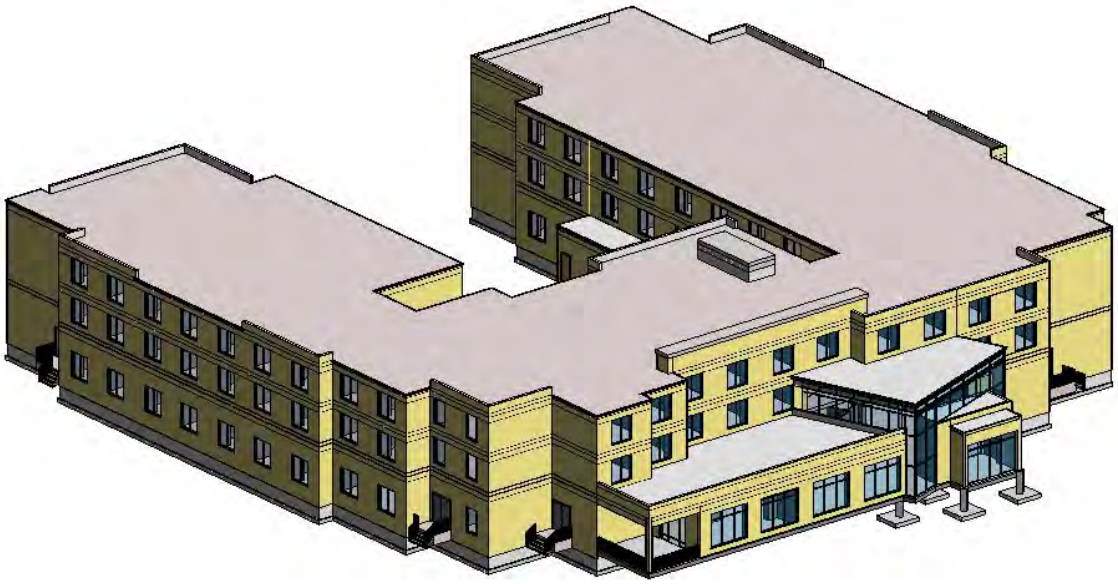

Figure D-2. 3D model of Small Hotel

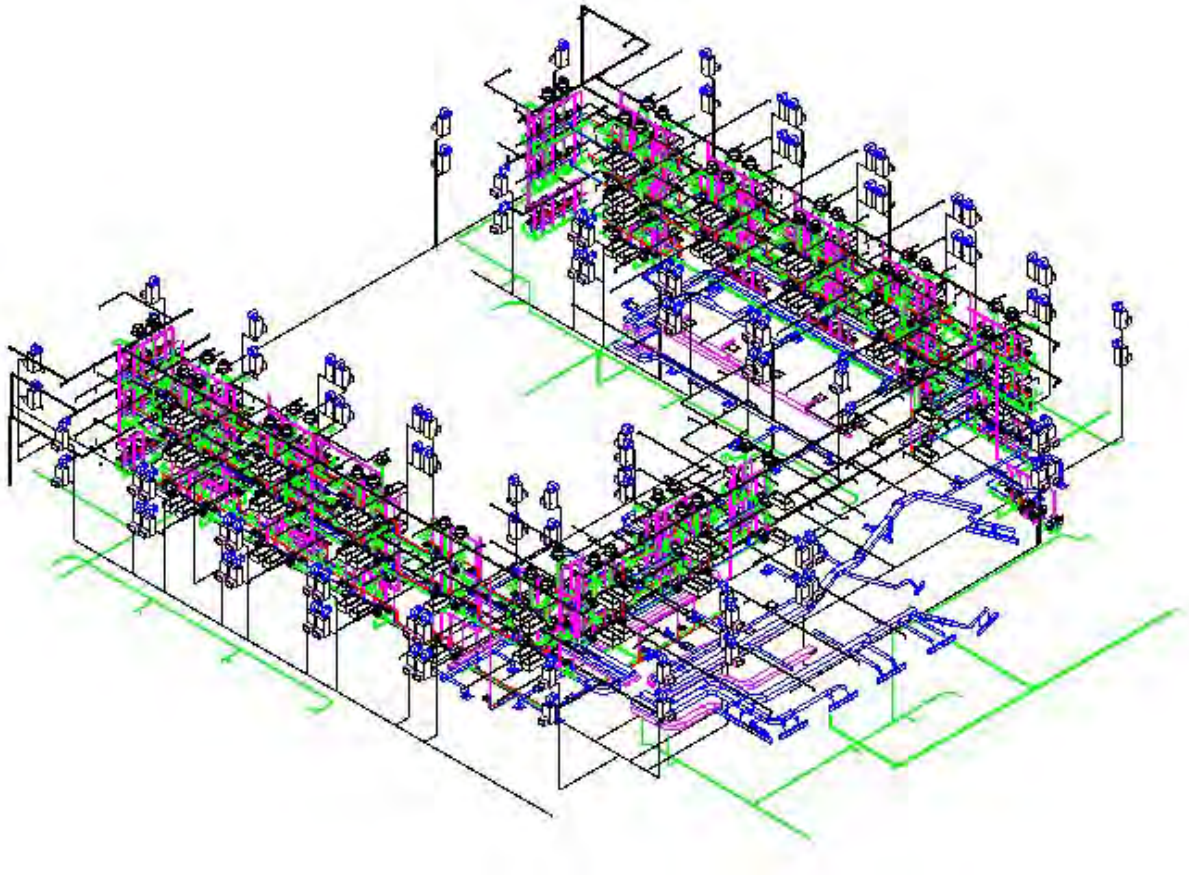

Figure D-2. 3D model of MEP systems for Small Hotel

Mid-Rise Apartment Building

As shown in Figures E-1 through E-3, the midrise apartment building has a 20 level residential tower and an attached 7 level parking structure. It is a concrete structure building with a largely curtain wall façade system. The residential tower reaches an overall height of 209' with the highest occupied level at 197'10". The 2021 ICC changes impacted the midrise apartment building at the Services level of the prepared estimate. The 2021 ICC changes were applied to the drawing set for the main retail space and the tenant built-outs were not evaluated. The HVAC, fire protection and electrical systems all showed an increase in cost.

A primary contributor to the cost increase found in the 2021 I-Codes changes was the change in Fire Protection and Life Safety F110-18 which removed open parking garages from being exempt from sprinkler systems. Additional cost increases were due to the 2021 IBC E27-18 change requiring more lighting in staircases used as means of egress. 2020 NEC changes required additional receptacles in garages in multifamily dwellings (FR-7604), and addition of GFCI for indoor damp and wet dwelling locations (FR-8121).

Table E. Mid-Rise Apartment Building Estimated Cost Summary

	ASTM Uniformat II Levels	*2017 FBC Costs*	*2018 I-Codes Costs*	*2021 I-Codes Costs*
1	***Substructure***	$1,545,295	$1,545,295	$1,545,295
	A10 -Foundations	$1,545,295	$1,545,295	$1,545,295
	A20 -Basement	$-	$-	$-
2	***Shell***	$12,870,467	$12,870,467	$12,870,467
	B10 -Superstructure	$10,105,934	$10,105,934	$10,105,934
	B20 -Ext. Enclosure	$2,693,593	$2,693,593	$2,693,593
	B30 - Roofing	$70,940	$70,940	$70,940
3	***Interiors***	$7,354,169	$7,354,169	$7,354,169
	C10 - Int. Construction	$2,300,013	$2,300,013	$2,300,013
	C20 - Stairs	$64,001	$64,001	$64,001
	C30 – Int. Finishes	$4,990,156	$4,990,156	$4,990,156
4	***Services***	$18,341,901	$26,054,220	$26,343,108
	D10 - Conveying	$1,456,072	$1,456,072	$1,456,072
	D20 - Plumbing	$7,439,511	$7,537,498	$7,537,498
	D30 - HVAC	$3,329,696	$4,921,094	$4,921,094
	D40 - Fire Protection	$236,170	$360,670	$636,367
	D50 - Electrical	$5,880,451	$11,778,886	$11,792,076
5	***Equip. & Furnishings***	$-	$4,545,000	$4,545,000
6	***Special Construction***	$-	$-	$-
7	***Building Sitework***	$-	$-	$-
	Total Cost	$40,111,832	$52,369,151	$52,658,039
	Change from Previous		30.56%	0.55%
	Change from 2017 FBC		30.56%	31.28%

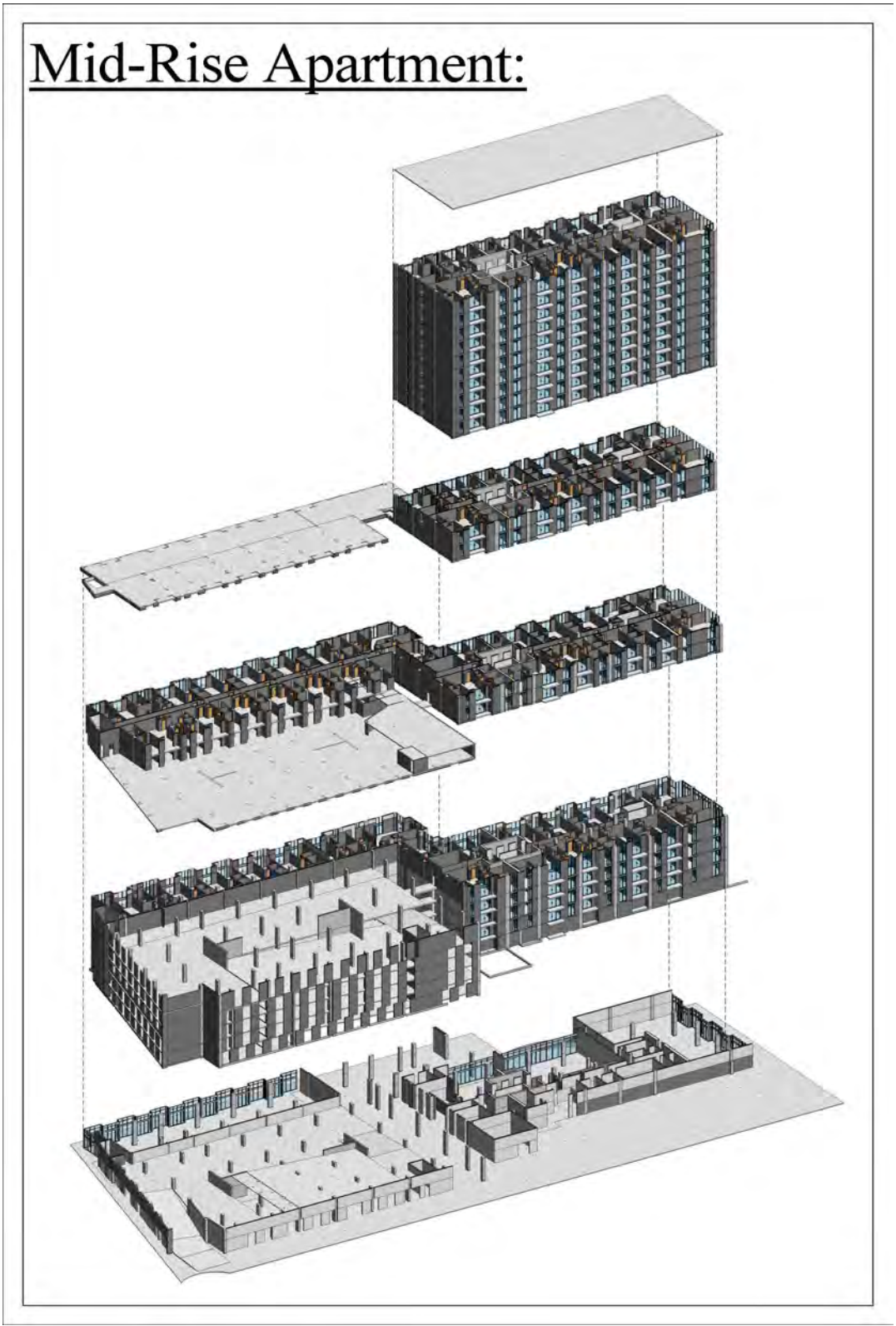

Figure E-1. 3D sections of Mid-Rise Apartment Building

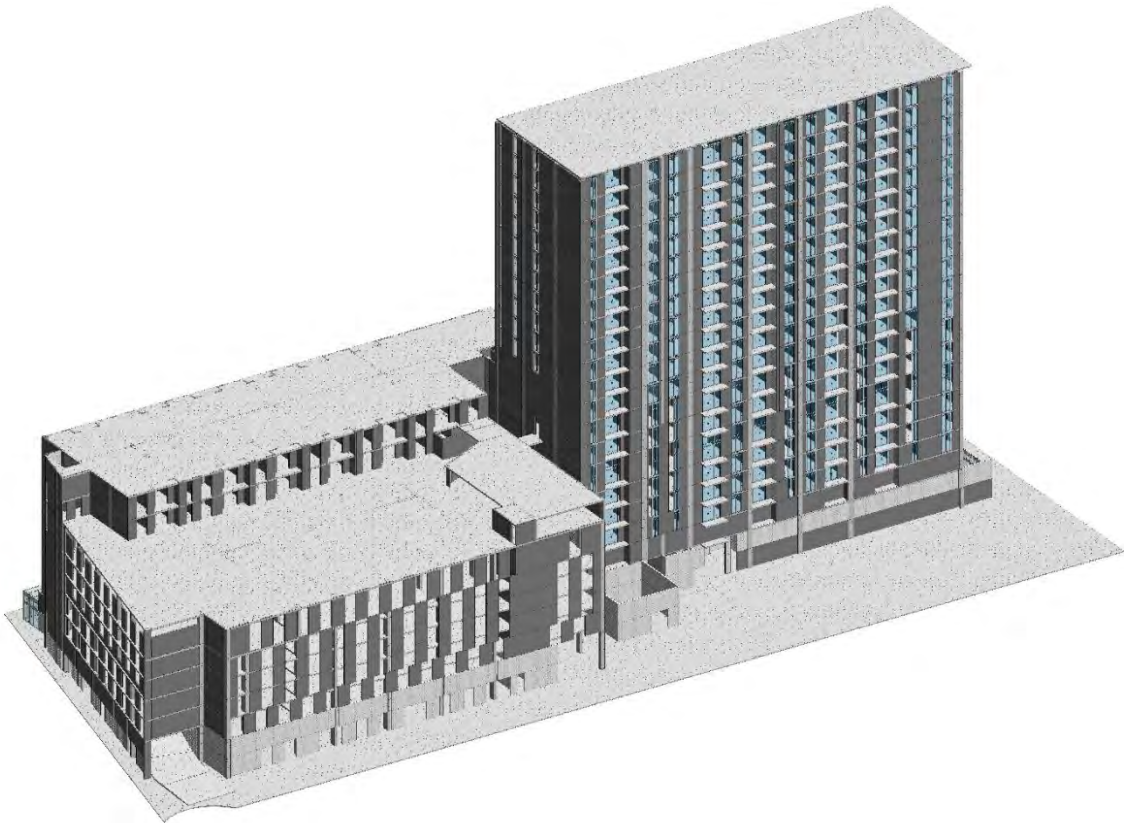

Figure E-2. 3D model of Mid-Rise Apartment Building

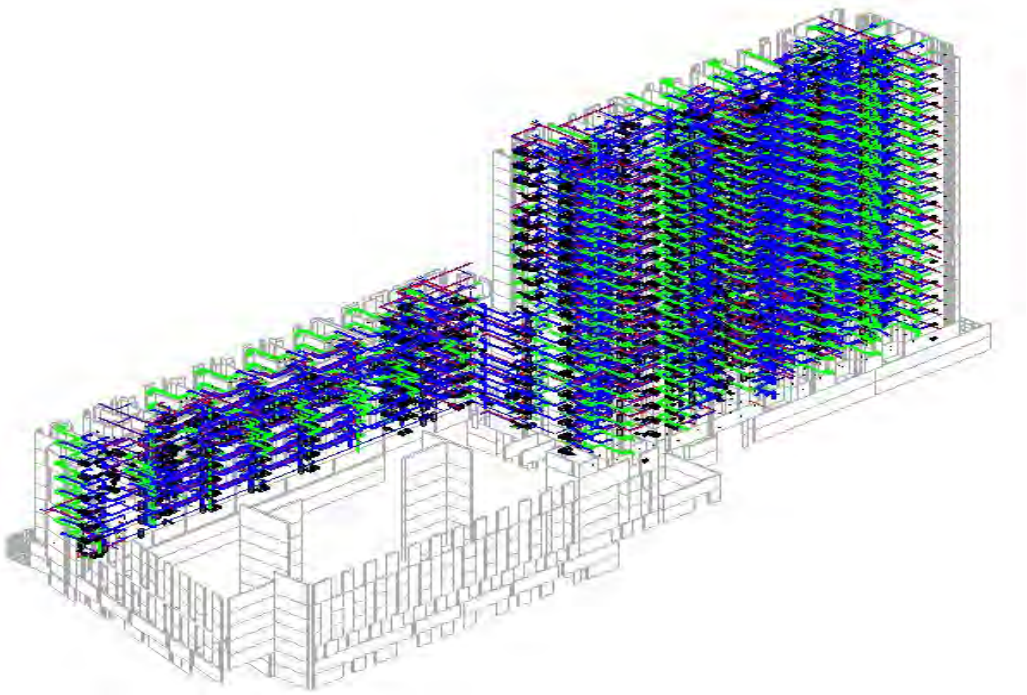

Figure E-2. 3D model of MEP systems for Mid-Rise Apartment Building

1-Story Residence

As shown in Figures F-1 through F-3, the residence has three bedrooms and an open concept kitchen and family room. There is an attached 385 SF two-car garage, and a concrete outdoor area connected the family room and kitchen. The hip roof is constructed of pre-engineered roof trusses with a standard shingle roof covering. The 2021 code changes impacted the 1-story residence at the roofing, mechanical and electrical levels of the prepared estimate. Approved plans were used to develop the model for estimation and code adjustments to meet the 2021 ICC code changes.

One contributor to the cost increase found in the 2021 code changes was due to change in IRC RM33-18 which required that Building cavities used as plenums to be sealed. IRC changes to RM13-18 require that exhaust ducts be terminated on the outside of the building and be equipped with a backdraft damper.

Cost increases were also caused due to changes in IRC RM33-18 which required that Building cavities used as plenums to be sealed.

Moreover, changes in the NEC led to additional costs by adding requirements for GFCI in indoor damp and wet locations of dwellings (FR-8121), additional outdoor accessible mounted emergency disconnects (FR-8462), surge protection to dwelling unit services (FR-8546). The change in FR-7705 added 250V receptacles and removed amperage limitations for GFCI protection for dwellings.

Table F. 1-Story Residence Cost Summary

	ASTM Uniformat II Levels	*2017 FBC Costs*	*2018 I-Codes Costs*	*2021 I-Codes Costs*
1	*Site Work*	$-	$-	$-
2	*Foundations*	$17,312	$17,312	$17,312
3	*Framing*	$41,260	$41,260	$41,260
4	*Exterior Walls*	$40,084	$40,084	$40,084
5	*Roofing*	$18,782	$18,782	$19,144
6	*Interiors*	$32,642	$32,642	$32,642
7	*Specialties*	$-	$15,000	$15,000
8	*Mechanical*	$60,474	$99,210	$104,463
9	*Electrical*	$12,770	$43,670	$44,450
	Total Cost	**$223,324**	**$307,960**	**$314,356**
	Change from Previous		37.90%	2.08%
	Change from 2017 FBC		37.90%	40.76%

Figure F-1. 3D sections of 1-Story Residence

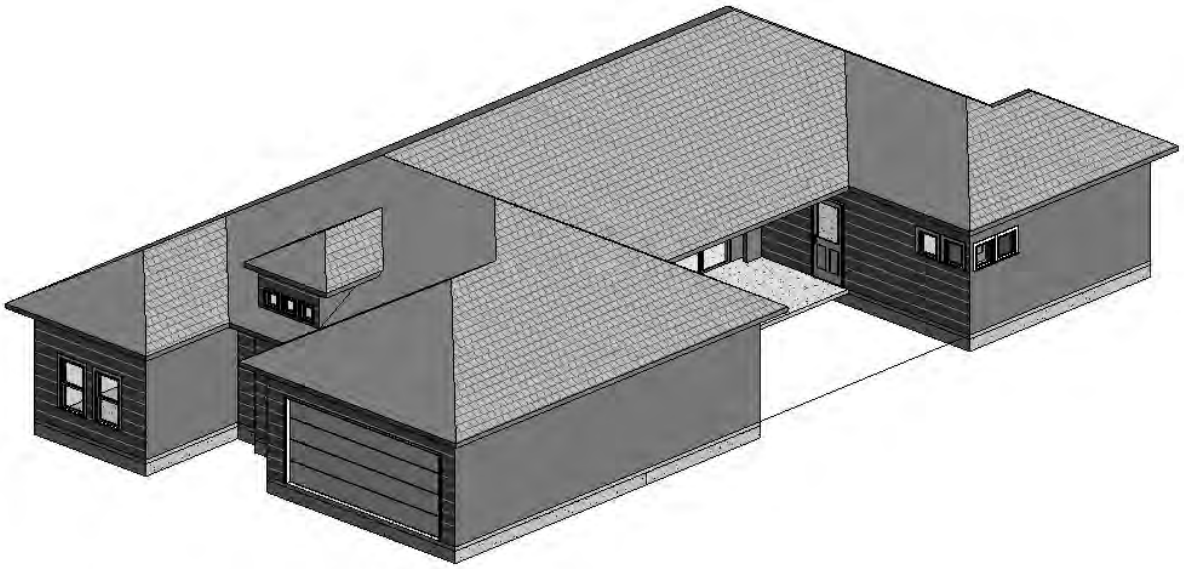

Figure F-2. 3D model of 1-Story Residence

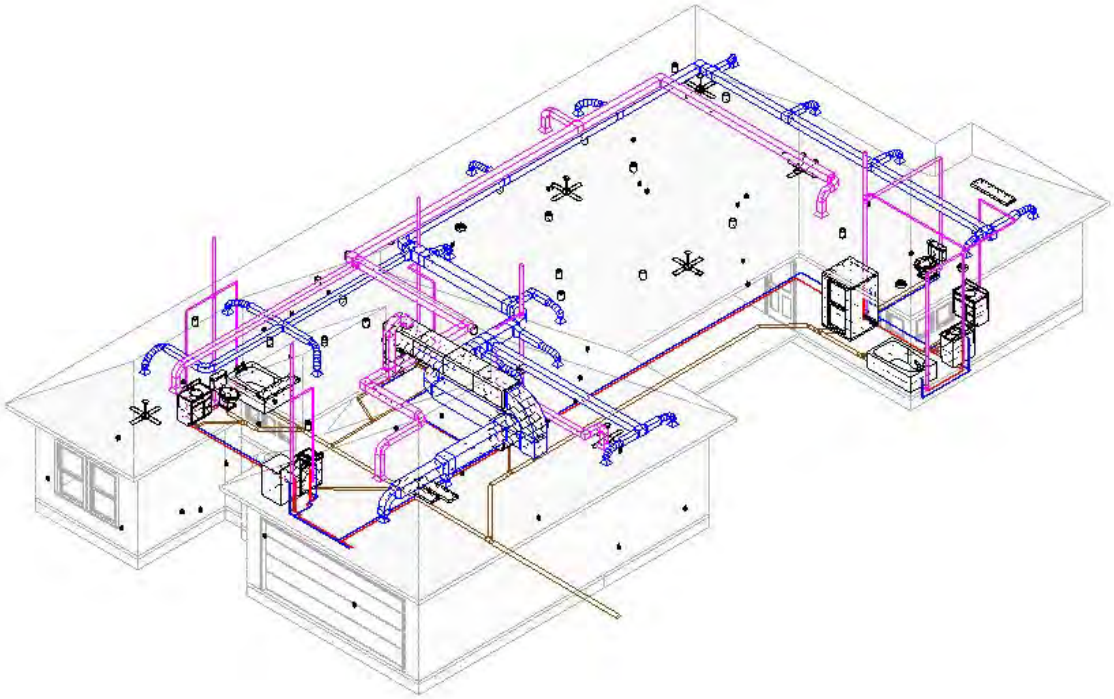

Figure F-3. 3D model MEP systems for 1-Story Residence

2-Story Residence

As shown in Figures G-1 through G-3, the residence has three bedrooms with the master suite on the lower level and two bedrooms on the second level. There is a 497 SF attached two car garage and an open style floor plan on the first floor. In addition to the two bedrooms, the second level has a game room and a bathroom connected to the two bedrooms. The roof over the lower level is a hip roof and the second level has a gable roof. Both roofs are made from pre-engineered roof trusses with a standard roof shingle covering. The 2021 code changes impacted the 2-story residence at the roofing, mechanical and electrical levels of the prepared estimate. Approved plans based on the were used to develop the model for estimation and code adjustments to meet the 2021 ICC code changes.

One contributor to the cost increase found in the 2021 code changes was due to change in IRC RM33-18 which required that Building cavities used as plenums to be sealed. IRC changes to RM13-18 require that exhaust ducts be terminated on the outside of the building and be equipped with a backdraft damper.

Cost increases were also caused due to changes in IRC RM33-18 which required that Building cavities used as plenums to be sealed.

Moreover, changes in the NEC led to additional costs by adding requirements for GFCI in indoor damp and wet locations of dwellings (FR-8121), additional outdoor accessible mounted emergency disconnects (FR-8462), surge protection to dwelling unit services (FR-8546). Change in FR-7705 adds 250V receptacles and removes amperage limitations for GFCI protection for dwellings.

Table G. 1-Story Residence Cost Summary

	ASTM Uniformat II Levels	*2017 FBC Costs*	*2018 I-Codes Costs*	*2021 I-Codes Costs*
1	*Site Work*	$-	$-	$-
2	*Foundations*	$31,071	$31,071	$31,071
3	*Framing*	$40,309	$40,309	$40,309
4	*Exterior Walls*	$58,812	$58,812	$58,812
5	*Roofing*	$27,578	$27,578	$28,110
6	*Interiors*	$67,536	$67,536	$67,536
7	*Specialties*	$3,291	$18,291	$18,291
8	*Mechanical*	$73,617	$148,666	$159,453
9	*Electrical*	$21,853	$63,803	$64,598
	Total Cost	$324,066	$456,065	$468,180
	Change from Previous		40.73%	2.66%
	Change from 2017 FBC		40.73%	44.47%

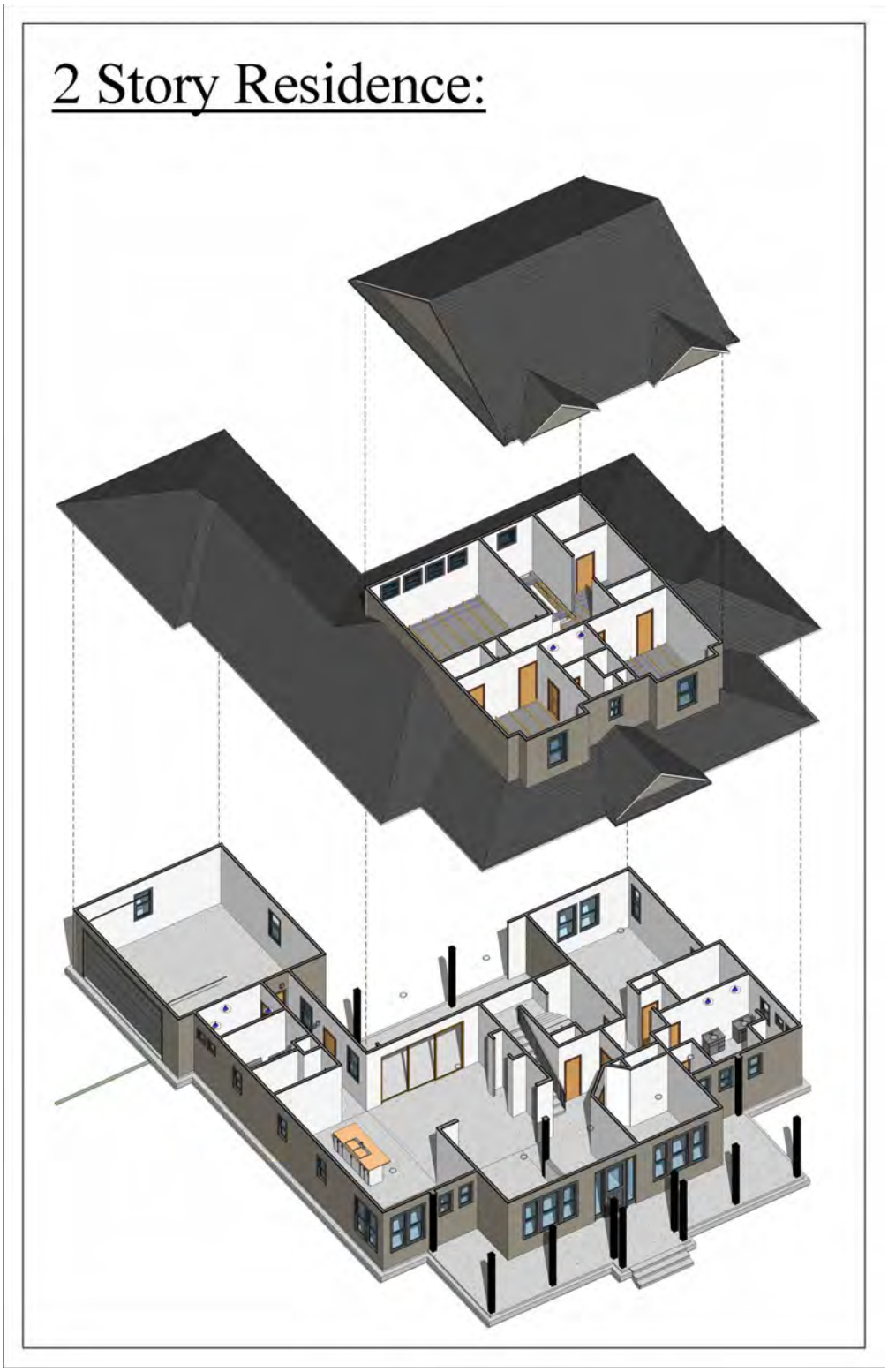

Figure G-1. 3D sections of 2-Story Residence

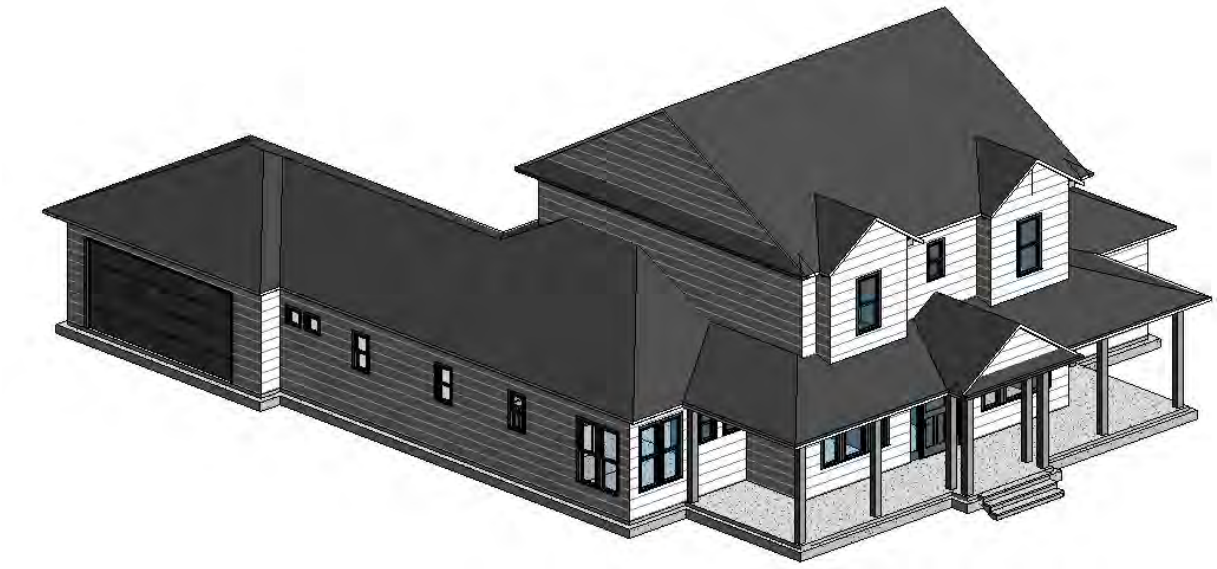

Figure G-2. 3D model of 2-Story Residence

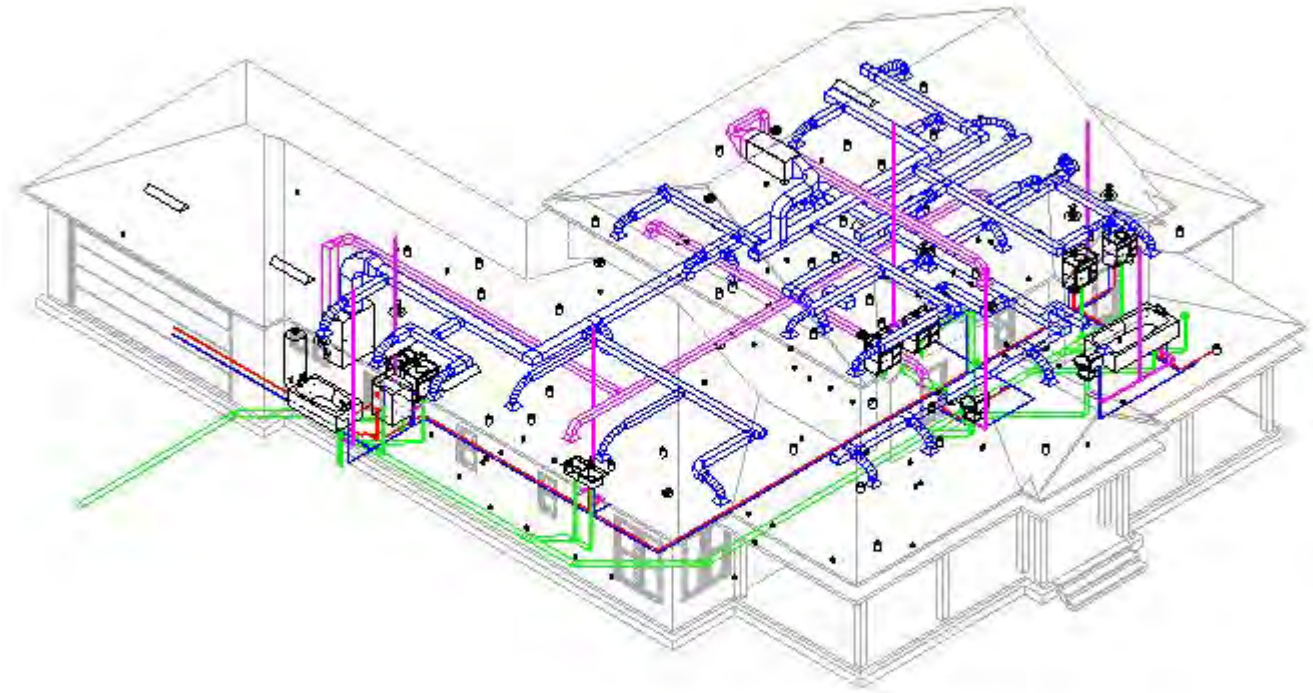

Figure G-3. 3D model MEP systems for 2-Story Residence

Conclusions and Recommendations

The 2021 I-Codes changes that are prescriptive in nature and have the potential of impacting construction cost were identified and used to develop cost estimates for two (2) prototype residential and five (5) prototype commercial/institutional building information models (BIMs). These construction cost estimates were used to make a comparison between the 2017 FBC specific code changes, 2018 I-Codes and 2021 I-Codes changes based on models of each of the seven building types.

The RS Means 2017 Cost data for the Orlando Region was used to price these prototype buildings. Model based quantities were used and verified along with some SF style estimates from RS means for certain systems that were not fully defined in the models. Based on these construction cost estimates, it was determined that the relative increase in cost due to the 2021 I-Codes changes ranged from approximately 0.02% for the Small Hotel prototype to approximately 1.32% for the Small Office building. The estimated relative change in cost for the residences was approximately 2.08% for the 1-story house to approximately 2.66% for the 2-story house. The average changes in cost were 0.47% for the commercial/institutional buildings and 2.37% for the residences.

Future research should focus on the use of the developed models and estimates to evaluate future code changes. In addition, workshops should be conducted to introduce and encourage designers, builders and other code change petitioners to use the models to prospectively evaluate the cost impact of their proposed code changes. In addition, the modeling of other type of buildings should be explored to develop an even more diverse set of building models.

APPENDIX A

Table 1. 2021 IMC Changes Cost Impact						
CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
M2-18	Add new definition for INDIRECT EVAPORATIVE COOLING AND DIRECT EVAPORATIVE COOLING as follows: **INDIRECT EVAPORATIVE COOLING.** The evaporative cooling process where water evaporates into a secondary air stream, removing heat from a primary air stream utilizing a heat exchanger. **DIRECT EVAPORATIVE COOLING.** The evaporative cooling process where water evaporates directly into the air stream, reducing the air's dry-bulb temperature and raising its humidity level.		X			Necessary addition for clarification
M4-18	Change existing definition for FLAMMABILITY CLASSIFICATION (REFRIGERANT), REFRIGERANT SAFETY CLASSIFICATIONS AND TOXICITY CLASSIFICATION to: **REFRIGERANT SAFETY ~~CLASSIFICATIONS~~ GROUP CLASSIFICATION.** The alphabetical/numerical designation that indicate indicates both the toxicity and flammability ~~classification~~ classifications of refrigerants. Toxicity. See Toxicity classification (Refrigerant). Flammability. See Flammability classification (Refrigerant). **TOXICITY CLASSIFICATION (REFRIGERANT).** An ~~alphabetic~~ alphabetical designation used to identify the toxicity of refrigerants. Class A indicates a refrigerant with lower toxicity. Class B indicates a refrigerant with higher toxicity. **FLAMMABILITY CLASSIFICATION (REFRIGERANT).** The alphabetical/numerical designation used to identify the flammability of refrigerants. Indicates a refrigerant with no flame propagation. Indicates a refrigerant with lower flammability and lower burning velocity. Indicates a refrigerant with lower flammability. Indicates a refrigerant with higher flammability.		X			Clarification
M5-18	Change existing definition for PRESS-CONNECT JOINT to: **PRESS-CONNECT JOINT.** A permanent mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion - resistant grip or bite ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.		X			Clarification
M6-18	Change existing definition for Seismic resistance to: **301.18 Seismic resistance.** Where earthquake loads are applicable in accordance with the International Building Code, mechanical system supports, anchorage, and bracing, shall be		X			Clarification

Table 1. 2021 IMC Changes Cost Impact						
CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	designed and installed for the seismic forces in accordance with Chapter 16 of the International Building Code.					
M10-18	Add new definition for 307.1.2 Identification and 307.2.3.3 Identification as follows: **307.1.2 Identification.** ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain. **307.2.3.3 Identification.** ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain.		X			Clarification
M11-18	Add new definition for Condensate discharge as follows: **307.2.1.1 (IPC [M] 314.2.1.1) Condensate discharge.** Condensate drains shall not directly connect to any plumbing drain, waste or vent pipe. Condensate drains shall not discharge into a plumbing fixture other than a floor sink, floor drain, trench drain, mop sink, hub drain, standpipe, utility sink or laundry sink. Condensate drain connections to a lavatory wye branch tailpiece or to a bathtub overflow pipe, shall not be considered as discharging to a plumbing fixture. Except where discharging to grade outdoors, the point of discharge of condensate drains shall be located within the same occupancy, tenant space or dwelling unit as the source of the condensate.		X			Necessary addition for clarification
M14-18	Change existing definition for Drain pipe materials and sizes to: **307.2.2 Drain pipe materials and sizes.** Components of the condensate disposal system shall be ABS, cast iron, ~~galvanized steel~~, copper , and copper alloy, CPVC, cross-linked polyethylene, galvanized steel, PE-RT, polyethylene, ~~ABS~~ polypropylene, ~~CPVC,~~ PVC , or ~~polypropylene~~ PVDF pipe or tubing. Components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the International Plumbing Code relative to the material type. Condensate waste and drain line size shall be not less than 3/4-inch pipe size ~~internal diameter~~ and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe		X			Clarification

Table 1. 2021 IMC Changes Cost Impact						
CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	or tubing shall be sized in accordance with Table 307.2.2.					
M17-18	Change existing definition for 401.4 Intake opening location and 501.3.1 Location of exhaust outlets to: **401.4 Intake opening location.** Air intake openings shall comply with all of the following: 3. Intake openings shall be located not less than 3 feet (914 mm) below contaminant sources where such sources are located within 10 feet (3048 mm) of the opening. Separation is not required between intake air openings and living space exhaust air openings of an individual dwelling unit or sleeping unit where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions. **501.3.1 Location of exhaust outlets.** The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances: 3. For all environmental air exhaust: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings into buildings for all occupancies other than Group U, and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious. Separation is not required between intake air openings and living space exhaust air openings of an individual dwelling unit or sleeping unit where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.		X			Clarification
M18-18	Change existing definition for 403.2.1 Recirculation of air to: **403.2.1 Recirculation of air.** The outdoor air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that: 2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces. The design and installation of dehumidification		X			Prevents water damage.

Table 1. 2021 IMC Changes Cost Impact

CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	systems shall comply with ACCA Manual SPS, HVAC Design for Swimming Pools and Spas.					
M20-18	Change existing definition for 401.2 Ventilation required and 403.1 Ventilation system to: **401.2 Ventilation required.** Every occupied space shall be ventilated by natural means in accordance with Section 402 or by mechanical means in accordance with Section 403. ~~Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch water column (50 Pa) in accordance with Section R402.4.1.2 of the International Energy Conservation Code, the dwelling unit shall be ventilated by~~ Dwelling units complying with the air leakage requirements of the International Energy Conservation Code or ASHRAE 90.1 shall be ventilated by mechanical means in accordance with Section 403. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407. **403.1 Ventilation system.** Mechanical ventilation shall be provided by a method of supply air and return or exhaust air except that mechanical ventilation air requirements for Group R-2, R-3 and R-4 occupancies ~~three stories and less in height above grade plane~~ shall be provided by an exhaust system, supply system or combination thereof. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The system shall not be prohibited from producing negative or positive pressure. The system to convey ventilation air shall be designed and installed in accordance with Chapter 6.			X	Minimal	Clarification
M24-18	Change existing definition for TABLE 403.3.1.1 to: g. Mechanical exhaust is required and recirculation from such spaces is ~~prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces~~ prohibited. For occupancies other than science laboratories, where there is a wheel type energy recovery ventilation (ERV) unit in the exhaust system design, the volume of air leaked from the exhaust airstream into the outdoor airstream within the ERV shall be less than 10 percent of the outdoor air volume. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Items 2 and 4).		X			Clarification
M25-18	Change existing definition for TABLE 403.3.1.1 to: OCCUPANCY CLASSIFICATION | OCCUPANT DENSITY #/1000 FT^{2} [a] | PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R^{p} | AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a | EXHAUST AIRFLOW RATE CFM/FT^{2} [a]			X	$0.50 per fan cfm	Clarification

Table 1. 2021 IMC Changes Cost Impact

CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	<table><tr><td></td><td></td><td>CFM/PERSON</td><td>CFM/FT² [a]</td><td></td></tr><tr><td>Commercial laundry</td><td>10</td><td>~~25~~5</td><td>~~-~~0.12</td><td>-</td></tr><tr><td>Kitchens[b]</td><td>-</td><td>-</td><td>-</td><td>~~25~~50/100f</td></tr><tr><td>Toilet rooms and bathrooms[g]</td><td>-</td><td>-</td><td>-</td><td>~~20~~25/50f</td></tr></table>					
M28-18	Change existing definition for 403.3.2.5 Ventilating equipment: **403.3.2.5 Ventilating equipment.** ~~Exhaust equipment serving single dwelling units~~ Fans providing exhaust or outdoor air shall be listed and labeled to provide the minimum required air flow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51.		X			Clarification
M29-18	Delete existing definition for 403.3.1.5 Balancing. Add new definition for 608.1 Balancing as follows: **608.1 Balancing.** Air distribution, ventilation and exhaust systems shall be provided with means to adjust the system to achieve the design airflow rates and shall be balanced by an approved method. Ventilation air distribution shall be balanced by an approved method and such balancing shall verify that the air distribution system is capable of supplying and exhausting the airflow rates required by Chapter 4.		X			Clarification
M30-18	Change existing definition for 403.3.1.3 System operation to: **403.3.1.3 System operation.** The minimum flow rate of outdoor air that the ventilation system must be capable of supplying during its operation shall be permitted to be based on the rate per person indicated in Table 403.3.1.1 and the actual number of occupants present. Where demand controlled ventilation is employed to adjust the outdoor air flow rate based on the actual number of occupants present, the minimum quantity of outdoor air shall not fall below that determined from the area outdoor airflow rate column of Table 403.3.1.1 during periods when the building is expected to be occupied.		X			Clarification
M31-18	Change existing definition for 407.1 General to: **407.1 General.** Mechanical ventilation for ambulatory care facilities and Group I-2 occupancies shall be designed and installed in accordance with this code and ASHRAE 170. and NFPA 99.			X	Minimal	Clarification
M32-18	Change existing definition for Balanced ventilation, 403.3.2.1 Outdoor air for dwelling units to: **BALANCED VENTILATION.** Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate ~~and~~ is within 10% of the total mechanical supply airflow rate ~~are substantially the same.~~ **403.3.2.1 Outdoor air for dwelling units.** An outdoor air ventilation system consisting of a mechanical exhaust system,	X			Minimal	Clarification

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Sub Code:						
	supply system or combination thereof shall be installed for each dwelling unit. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9. QOA=0.01Afloor+7.5(Nbr +1) **(Equation 4-9)** where: Q_{OA} = outdoor airflow rate, cfm Afloor = ~~conditioned~~ floor area, ft^2 N_{br} = number of bedrooms; not to be less than one **Exceptions:** 1. The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor air flow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9.. 2. The minimum mechanical ventilation rate determined in accordance with Equation 4.9 shall be reduced ~~by 25%~~ by 30%, provided that ~~all~~ both of the following conditions apply: 2.1. A ducted system supplies ~~recirculated~~ ventilation air directly to each bedroom and ~~the largest common area.~~ 2.2. ~~For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through the ducted system, or for intermittently operated systems, an equivalent air recirculation is provided during each four-hour period~~ to one or more of the following rooms: 2.2.1. Living room 2.2.2. Dining room 2.2.3. Kitchen. 2.2.~~2.3.~~ The whole-house ventilation system is a balanced ventilation system.					
M34-18	Change existing definition for 501.2 Independent system required, 504.1 Installation and 505.3 Exhaust ducts to: **501.2 Independent system required.** Single or combined mechanical exhaust systems for environmental air shall be independent of all other exhaust systems. Dryer, domestic kitchen and hazardous exhaust shall be independent of all other		X			Clarification

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CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
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	systems. Type I exhaust systems shall be independent of all other exhaust systems except as provided in Section 506.3.5. Single or combined Type II exhaust systems for food-processing operations shall be independent of all other exhaust systems. ~~Kitchen~~ Commercial kitchen exhaust systems shall be constructed in accordance with ~~Section 505 for domestic cooking operations and~~ Sections 506 through 509. ~~for commercial cooking operations.~~ **504.1 Installation.** Clothes dryers shall be exhausted in accordance with the manufacturer's instructions. Dryer exhaust systems shall ~~be independent of all other systems and shall~~ convey the moisture and any products of combustion to the outside of the building. **505.3 Exhaust ducts.** Domestic cooking exhaust equipment shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be air tight, and shall be equipped with a backdraft damper. ~~, and shall be independent of all other exhaust systems.~~ Installations in Group I-1 and I-2 occupancies shall be in accordance with the International Building Code and Section 904.13 of the International Fire Code. Delete existing definition for 510.4 Independent system.					
M35-18	Add new definition for 502.20.1 Operation as follows: **502.20.1 Operation.** The exhaust system for manicure and pedicure stations shall have controls that operate the system continuously when the space is occupied.			X	$1.00 per room sqft.	Necessary addition for clarification
M43-18	Change existing definition for 510.6.5 Makeup air to: **510.6.5 Makeup air.** Makeup air from all sources shall be provided during operations at a rate approximately equal to the rate that air is exhausted by the hazardous exhaust system. Makeup air shall be provided by gravity or mechanical means or both. Mechanical makeup air systems shall be automatically controlled to start and operate simultaneously with the exhaust system. The makeup air shall not reduce the effectiveness of the exhaust system. Makeup air intakes shall be located in accordance with Section 401.4.		X			Clarification
M45-18	Change existing definition for 507.1 General to: **507.1 General.** **Exceptions:** 4. Smoker ovens with integral exhaust systems provided that the appliance is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application and complies with Chapter 5.		X			Clarification
M46-18	Change existing definition for 507.1 General to:		X			Clarification

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CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
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	507.1 General. **Exceptions:** 4. Smoker ovens with integral exhaust systems provided that the appliance is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application and complies with Chapter 5.					
M47-18	Change existing definition for 506.3.9 Grease duct horizontal cleanouts to: **506.3.9 Grease duct horizontal cleanouts.** 6. ~~Shall be~~ Be located at grease reservoirs. 7. Be located within 3 feet of horizontal discharge fans.		X			Clarification to coordinate with existing NFPA 96 requirements.
M52-18	Change existing definition for 506.5.2 Pollution-control units to: **506.5.2** **506.5.2 Pollution-control units.** The installation of pollution-control units shall be in accordance with ~~the manufacturer's installation instructions and~~ all of the following: 1. Pollution-control units shall be listed and labeled in accordance with UL ~~1978~~ 8782. 2. Fans serving pollution-control units shall be listed and labeled in accordance with UL 762. 3. ~~Pollution~~Bracing and supports for pollution-control units shall be ~~mounted and secured in accordance with the manufacturer's installation instructions and~~ of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the International Building Code. 4. Pollution-control units located indoors shall be listed and labeled for such use. Where enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be ~~located in a room or space~~ listed and labeled, in accordance with UL 2221 or ASTM E2336, for location in an enclosure having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer's installation instructions. 5. ~~A clearance of not less than 18 inches (457 mm)~~ Clearances shall be maintained between the pollution-control unit and combustible material in accordance with the listing.		X			Provides clarity on the requirements for PCUs, as well as additional flexibility.

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M53-18 Part I	Add new definition for 504.6 Booster fans prohibited as follows: **504.6 Booster fans prohibited.** Domestic booster fans shall not be installed in dryer exhaust systems.		X			Necessary addition for clarification
M54-18	Change existing definition for 506.3.7 Prevention of grease accumulation in grease ducts to: **506.3.7 Prevention of grease accumulation in grease ducts.** Duct systems serving a Type I hood shall be constructed and installed so that grease cannot collect in any portion thereof, and the system shall slope not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) toward the hood or toward a grease reservoir designed and installed in accordance with Section 506.3.7.1. Where horizontal ducts exceed 75 feet (22 860 mm) in length, the slope shall be not less than one unit vertical in 12 units horizontal (8.3-percent slope). **Exception:** Factory-built grease ducts shall be installed at a slope that is in accordance with the listing and manufacturer's installation instructions.		X			Clarification
M58-18	Change existing definition for 514.2 Prohibited applications to: **514.2 Prohibited applications.** Energy recovery ventilation systems shall not be used in the following systems: 1. Hazardous exhaust systems covered in Section 510. 2. Dust, stock and refuse systems that convey explosive or flammable vapors, fumes or dust. 3. Smoke control systems covered in Section 513. 4. Commercial kitchen exhaust systems serving Type I ~~or Type II~~ hoods. 5. Clothes dryer exhaust systems covered in Section 504.		X			Clarification
M59-18	Add new definition for 504.4.1 Termination location as follows: **504.4.1 Termination location.** Exhaust duct terminations shall be in accordance with the dryer manufacturer's installation instructions. Where the manufacturer's instructions do not specify a termination location, the exhaust duct shall terminate not less than 3 feet (914 mm) in any direction from openings into buildings including openings in ventilated soffits.		X			Necessary addition for clarification
M62-18	Change existing definition for 511.1.5 Explosion relief vents to: **511.1.5 Explosion control.** Explosion control shall be provided in accordance with the requirements of the International Fire Code on all systems that convey combustible dust or combustible refuse or stock that ~~produce~~ produces combustible dusts in such a manner that the concentration and conditions could create a fire or explosion hazard. Determination of concentrations or conditions that are deemed to not create a fire or explosion hazard shall be based on a Dust Hazard Analysis prepared in		X			Clarification

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	accordance with Section 2203.2 of the International Fire Code.					
M63-18	Change existing definition for 602.2 Construction and 603.5.1 Gypsum ducts to: **602.2 Construction.** Plenum enclosure construction materials that are exposed to the airflow shall comply with the requirements of Section 703.5 of the International Building Code or such materials shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723. The use of gypsum boards to form plenums shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. ~~Air~~ Supply air plenums formed by gypsum boards shall not be incorporated in air-handling systems utilizing direct evaporative ~~coolers~~ cooling systems. **603.5.1 Gypsum ducts.** The use of gypsum boards to form air shafts (ducts) shall be limited to return air systems where the air temperatures do not exceed 125ºF (52ºC) and the gypsum board surface temperature is maintained above the airstream dew-point temperature. ~~Air~~ Supply air ducts formed by gypsum boards shall not be incorporated in air-handling systems utilizing direct evaporative ~~coolers~~ cooling systems.	X			Minimal	Clarification
M64-18	Change existing definition for 601.5 Return air openings to: **601.5 Return air openings.** **Exceptions:** 1. Where the air from such spaces is dehumidified in accordance with Section 403.2.1, Item 2. 2. Dedicated HVAC systems serving only such spaces. **Exceptions:** 1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen and are located not less than 10 feet (3048 mm) from the cooking appliances. 2. Taking return air from a kitchen is not prohibited in a dwelling unit where the kitchen and living spaces are in a single room and the cooking appliance is electric and located not less than 5 feet in any direction from the return air intake opening. ~~2~~3. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.	X			Minimal	Clarification
M71-18	Change existing definition for 602.2.1.8 Pipe and duct insulation within plenums to:		X			Clarification

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	602.2.1.8 Pipe and duct insulation within plenums. Pipe and duct insulation contained within plenums, including insulation adhesives, shall have a flame spread index of not more than 25 and a smoke developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Pipe and duct insulation shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F(121°C). Pipe and duct insulation shall be listed and labeled. Pipe and duct insulation shall not be used to reduce the maximum flame spread and smoke-developed indexes ~~specified in Section 602.2.1.7~~ except where the pipe or duct and its related insulation, coatings, and adhesives are tested as a composite assembly in accordance with section 602.2.1.7. ~~of the pipe, ducts, tubing, insulation, coatings and adhesives in accordance with ASTM E84 or UL 723.~~					
M72-18	Change existing definition for 607.4 Access and identification: **607.4 Access and identification.** ~~Fire~~ Access and identification of fire and smoke dampers shall ~~be provided with an *approved* means of access, to permit inspection and maintenance of the damper and its operating parts. Dampers equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 inches (305mm) square or provided with a removable duct section. The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire-resistance rating of the assembly. Access points shall be permanently identified on the exterior by a label having letters not less than 0.5 inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER. Access doors in ducts shall be tight fitting and suitable for the required duct construction.~~ comply with Sections 607.4.1 through 607.4.2. 607.4.1 **Access.** Fire and smoke dampers shall be provided with an approved means of access that is large enough to permit inspection and maintenance of the damper and its operating parts. Dampers equipped with fusible links, internal operators, or both shall be provided with an access door that is not less than 12 inches (305 mm) square or provided with a removable duct section. 607.4.1.1 The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire- resistance-rating of the assembly. Access doors		X			Clarification

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	in ducts shall be tight fitting and suitable for the required duct construction. 607.4.1.2 **Restricted Access.** Where space constraints or physical barriers restrict access to a damper for periodic inspection and testing, the damper shall be a single- or multi-blade damper and shall comply with the remote inspection requirements of NFPA 80 or NFPA 105. **607.4.2 Identification.** Access points shall be permanently identified on the exterior of a label having letters not less than 1/2 inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER.					
M74-18	Change existing definition for 604.3 Coverings and linings to: **604.3 Coverings and linings.** ~~Coverings~~ Duct coverings and linings, including adhesives where used, shall have a flame spread index not more than 25 and a smoke-developed index not more than 50, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Coverings and linings shall be listed and labeled. **Exception:** Polyurethane foam insulation that is spray applied to the exterior of ducts in attics and crawlspaces shall be subject to all of the following requirements: 1. The foam plastic insulation shall have a flame spread index not greater than 25 and a smoke developed index not greater than 450, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. 2. The foam plastic insulation shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). 3. The foam plastic insulation complies with the requirements of Section 2603 of the International Building Code. 4. The foam plastic insulation is protected against ignition in accordance with the requirements of Section 2603.4.1.6 of the International Building Code.	X			Minimal	Clarification
M80-18	Change existing definition for 801.21 Blocked vent switch to: **801.21 Blocked vent switch.** ~~The venting system for~~ oil-fired appliances shall be equipped with a device that will stop burner operation in the event that the venting system is obstructed. Such			X	Minimal	Clarification

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	device shall have a manual reset, and shall be installed in accordance with the manufacturer's instructions.					
M81-18	Add new definition for 920.4 Prohibited Uses as follows: **920.4 Prohibited Uses.** In Group I-2 and ambulatory care facilities, suspended-type unit heaters are prohibited in corridors, exit access stairways and ramps, exit stairways and ramps and patient sleeping areas.		X			Necessary addition for clarification
M83-18	Change existing definition for 905.1 General to: **905.1 General.** Fireplace stoves and solid-fuel-type room heaters shall be listed and labeled and shall be installed in accordance with the conditions of the listing. Fireplace stoves shall be tested in accordance with UL 737. Solid-fuel-type room heaters shall be tested in accordance with UL 1482. Fireplace inserts intended for installation in fireplaces shall be listed and labeled in accordance with the requirements of UL 1482 and shall be installed in accordance with the manufacturer's instructions. New Wood Burning Residential Hydronic Heaters shall be EPA certified.		X			Clarification
M84-18	Change existing definitions for Large-Diameter Ceiling Fan to: **LARGE-DIAMETER CEILING FAN.** A ceiling fan that is greater than 7 feet (2134 mm) in diameter. These fans are ~~sometimes~~ also referred to as High-Volume, Low-Speed (HVLS) fans.		X			Clarification
M85-18	Add new definitions for SECTION 202 to: **SECTION 202** **GENERAL DEFINITIONS** **UNVENTED ALCOHOL FUEL BURNING DECORATIVE APPLIANCE.** A stationary, self-contained appliance intended to be directly or indirectly secured to a wall or floor and not intended for duct connection. Such appliance burns alcohol and is made in a manufacturing facility for subsequent delivery to the installation site. Add new definition for SECTION 929 as follows: **SECTION 929** **UNVENTED ALCOHOL FUEL BURNING DECORATIVE APPLIANCES** **929.1 GENERAL.** Unvented alcohol fuel-burning decorative appliances shall be listed and labeled in accordance with UL1370 and shall be installed in accordance with the conditions of the listing, manufacturer's installation instructions, and Chapter 3.			X	Minimal	Necessary addition for clarification
M86-18 Part I	Change existing definitions for 908.1 General, 916.1 General, 918.1 Forced-air furnaces, 918.2 Heat pumps and 1101.2 Factory-built equipment and appliances to: **908.1 General.** A cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the		X			UL 60335-2-40 is harmonized with requirements

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	manufacturer's instructions. Factory-built cooling towers shall be listed in accordance with UL 1995, or UL/CSA 60335-2-40. **916.1 General.** Pool and spa heaters shall be installed in accordance with the manufacturer's instructions. Oil-fired pool and spa heaters shall be tested in accordance with UL 1261. Pool and spa heat pump water heaters shall comply with UL 1995, or UL/CSA 60335-2-40, or CSA C22.2 No. 236. **Exception:** Portable residential spas and portable residential exercise spas shall comply with UL 1563 or CSA C22.2 No. 218.1. **918.1 Forced-air furnaces.** Oil-fired furnaces shall be tested in accordance with UL 727. Electric furnaces shall be tested in accordance with UL 1995. or UL/CSA 60335-2-40. Solid fuel furnaces shall be tested in accordance with UL 391. Forced-air furnaces shall be installed in accordance with the listings and the manufacturer's instructions. **918.2 Heat pumps.** Electric heat pumps shall be tested in accordance with UL 1995, or UL/CSA 60335- 2-40. **1101.2 Factory-built equipment and appliances.** Listed and labeled self-contained, factory-built equipment and appliances shall be tested in accordance with UL 207, UL 412, UL 471 ~~or 1995~~, UL1995, UL/CSA 60335-2-40, or UL 60335-2-89. Such equipment and appliances are deemed to meet the design, manufacture and factory test requirements of this code if installed in accordance with their listing and the manufacturer's instructions.					in Canada and Europe. These requirements include provisions for the most current technology and use of flammable refrigerants and is currently being used to list new products.
M87-18	Change existing definition for 1004.1 Standards to: **1004.1 Standards.** Boilers shall be designed, constructed and certified in accordance with the ASME Boiler and Pressure Vessel Code, Section I or IV. Controls and safety devices for boilers with fuel input ratings of less than 12,500,000 Btu/hr (3,662,500 W) ~~or less~~ shall meet the requirements of ASME CSD-1. Controls and safety devices for boilers with inputs greater than or equal to 12,500,000 Btu/hr (3,662,500 W) shall meet the requirements of NFPA 85. Packaged oil-fired boilers shall be listed and labeled in accordance with UL 726. Packaged electric boilers shall be listed and labeled in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523.		X			Clarification
M89-18	Update existing definition for TABLE 1103.1. REFRIGERANT CLASSIFICATION, AMOUNT AND OEL		X			Modification adds an update to the

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						proposal from ASHRAE 34.
M93-18	Change existing definition for Scope, TABLE 1103.1 REFRIGERANT CLASSIFICATION, AMOUNT AND OEL, Industrial occupancies and refrigerated rooms, All occupancies, Protection from refrigerant decomposition, 1105.6.3 Ventilation rate, [F] 1105.9 Emergency pressure control system, Flammable refrigerants and 1108.2 Test gases to: **Scope.** This chapter shall govern the design, installation, construction and repair of refrigeration systems that vaporize and liquefy a fluid during the refrigerating cycle. ~~Refrigerant piping design and installation, including pressure vessels and pressure relief devices, shall conform to this code.~~ Permanently installed refrigerant storage systems and other components shall be considered as part of the refrigeration system to which they are attached. **Industrial occupancies and refrigerated rooms.** This section applies only to rooms and spaces that: are within industrial occupancies; contain a refrigerant evaporator; are maintained at temperatures below 68°F (20°C); and are used for manufacturing, food and beverage preparation, meat cutting, other processes and storage. Where a machinery room would otherwise be required by Section 1104.2, a machinery room shall not be required where all of the following conditions are met: 1. The space containing the machinery is separated from other occupancies by tight construction with tight-fitting doors. 2. Access is restricted to authorized personnel. 3. Refrigerant detectors are installed as required for machinery rooms in accordance with Section 1105.3. ~~**Exceptions**~~ **Exception:** ~~1.~~ Refrigerant detectors are not required in unoccupied areas that contain only continuous piping that does not include valves, valve assemblies, equipment, or equipment connections. ~~2. Where approved alternatives are provided, refrigerant detectors for ammonia refrigeration are not required for rooms or areas that are always occupied, and for rooms or areas that have high humidity or other harsh environmental conditions that are incompatible with detection devices.~~ 4. Surfaces having temperatures exceeding 800°F (427°C) and open flames are not present where any Group A2, B2, A3 or		X			Removes complexity of overlapping requirements i the IMC

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	B3 refrigerant is used (see Section 1104.3.4). 5. All electrical equipment and appliances conform to Class 1, Division 2, hazardous location classification requirements of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant ~~, other than ammonia,~~ in a single independent circuit would exceed 25 percent of the lower flammability limit (LFL) upon release to the space. 6. All refrigerant-containing parts in systems with a total connected compressor power exceeding 100 horsepower (hp) (74.6 kW) except evaporators used for refrigeration or dehumidification, condensers used for heating, control and pressure relief valves for either, low-probability pumps and connecting piping are located either outdoors or in a machinery room. **All occupancies.** The total of all Group A2, B2, A3 and B3 refrigerants ~~other than R-717, ammonia,~~ shall not exceed 1,100 pounds (499 kg) except where approved. **Protection from refrigerant decomposition.** Where any device having an open flame or surface temperature greater than 800°F (427°C) is used in a room containing more than 6.6 pounds (3 kg) of refrigerant in a single independent circuit, a hood and exhaust system shall be provided in accordance with Section 510. Such exhaust system shall exhaust combustion products to the outdoors. **Exception:** A hood and exhaust system shall not be required where any of the following apply: 1. The refrigerant is R-~~717, R-~~718 or R-744. 2. The combustion air is ducted from the outdoors in a manner that prevents leaked refrigerant from being combusted. **1105.6.3 Ventilation rate.** ~~For other than ammonia systems, the mechanical~~ Mechanical ventilation systems shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions, as required by Sections 1105.6.3.1 and 1105.6.3.2. ~~The minimum required emergency ventilation rate for ammonia shall be 30 air changes per hour in accordance with IIAR2.~~ Multiple fans or multispeed fans shall be allowed to produce the emergency ventilation rate and to obtain a reduced airflow for normal ventilation. **[F] 1105.9 Emergency pressure control system.** ~~Permanently installed refrigeration systems containing more than 6.6 pounds (3 kg) of flammable, toxic or highly toxic refrigerant or ammonia~~ Emergency pressure control systems shall be provided ~~with an~~					

<table>
<tr><th colspan="7">Table 1. 2021 IMC Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IMC CHANGE SUMMARY</th><th colspan="3">IMC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>~~emergency pressure control system~~ in accordance with Section 605.10 of the International Fire Code.
Flammable refrigerants. Where refrigerants of Groups A2, A3, B2 and B3 are used, the machinery room shall conform to the Class 1, Division 2, hazardous location classification requirements of NFPA 70.
Exceptions <u>Exception</u>:
~~1.Ammonia machinery rooms that are provided with ventilation in accordance with Section 1106.3.~~
~~2.~~Machinery rooms for systems containing Group A2L refrigerants that are in accordance with Section 1106.5.
1108.2 Test gases. Tests shall be performed with an inert dried gas including, but not limited to, nitrogen and carbon dioxide. Oxygen, air, combustible gases and mixtures containing such gases shall not be used.
~~Exception: The use of air is allowed to test R-717, ammonia, systems provided that they are subsequently evacuated before charging with refrigerant.~~
Add new definition for Refrigerants other than ammonia and Ammonia refrigerant as follows:
<u>Refrigerants other than ammonia.</u> <u>Refrigerant piping design and installation, including pressure vessels and pressure relief devices, for systems containing a refrigerant other than ammonia shall comply with this chapter and ASHRAE 15.</u>
<u>Ammonia refrigerant.</u> <u>Refrigeration systems using ammonia as the refrigerant shall comply with IIAR 2, IIAR 3, IIAR 4 and IIAR 5, and shall not be required to comply with this chapter.</u>
Delete existing definition for 1101.6 General, 1105.8 Ammonia discharge, and Ammonia room ventilation.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>M95-18</td><td>Change existing definition for 1101.2 Factory-built equipment and appliances to:
<u>Table 1101.2</u>
Factory-built equipment and appliances
<table><tr><th>EQUIPMENT</th><th>STANDARD</th></tr><tr><td>Refrigeration fittings, including press-connect, flared, and threaded</td><td>UL 109 and UL 207</td></tr><tr><td>Air conditioning equipment</td><td>UL 1995 or UL/CSA 60335-2-40</td></tr><tr><td>Packaged terminal air conditioners and heat pumps</td><td>UL 484 or UL/CSA 60335-2-40</td></tr><tr><td>Split-system air conditioners <u>and heat pumps</u></td><td>UL 1995 or UL/CSA 60335-2- 40</td></tr></table></td><td>X</td><td></td><td></td><td>Minimal</td><td>Clarification</td></tr>
</table>

Table 1. 2021 IMC Changes Cost Impact

CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	<table><tr><td>Dehumidifiers</td><td>UL 474 or UL/CSA 60335-2-40</td></tr><tr><td>Unit coolers</td><td>UL 412 or UL/CSA 60335-2-89</td></tr><tr><td>Commercial refrigerators, freezers, beverage coolers, and walk-in coolers</td><td>UL 471 or UL/CSA 60335-2-89</td></tr><tr><td>Refrigerating units and walk-in coolers</td><td>UL 427 or UL 60335-2-89</td></tr><tr><td>Refrigerant-containing components and accessories</td><td>UL 207</td></tr></table>					
M99-18	Change existing definition for SECTION 1109 to: **1109.2 Piping location.** Refrigerant piping shall comply with the installation location requirements of Sections 1109.2.1 through ~~1109.2.6~~ 1109.2.7. Refrigerant piping for group A2L and B2L shall also comply with the requirements of Section 1109.3. Refrigerant piping for group A2, A3, B2 and B3 shall also comply with the requirements of Section 1109.4. **1109.2.7 Pipe identification.** Refrigerant pipe located in areas other than the room or space where the refrigerating equipment is located shall be identified. The pipe identification shall be located at intervals not exceeding 20 feet on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be ½ inch. The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group A2, A3, B2, and B3 refrigerant the identification shall also include the following statement: "DANGER – Risk of Fire or Explosion. Flammable Refrigerant." For any Group B refrigerant, the identification shall also include the following statement: "DANGER - Toxic Refrigerant." ~~**1109.3.3 Pipe identification.** Refrigerant pipe located in areas other than the room or space where the refrigerating equipment is~~ located shall be identified. The pipe identification shall be located at intervals not exceeding 20 feet on the refrigerant piping or pipe insulation. The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping ~~system. For Group B2L refrigerants the identification shall also include the following statement: "DANGER - Toxic Refrigerant." The minimum height of lettering of the identification label shall be ½ inch.~~ ~~**1109.4.3 Pipe identification.** Refrigerant pipe shall be identified with the refrigerant designation and safety group classification of refrigerant used in the piping system and the following statement: "DANGER – Risk of Fire or Explosion. Flammable Refrigerant." For Group B2 and B3 refrigerants the identification shall also include the following statement: "DANGER - Toxic~~		X			Clarification

Table 1. 2021 IMC Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IMC CHANGE SUMMARY</th><th colspan="3">IMC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td></td><td>~~Refrigerant." The~~ identification shall be at intervals not exceeding 5 feet on the refrigerant piping or pipe insulation. The minimum height of lettering of ~~the identification label shall be 1 inch.~~</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>M101-18</td><td>Change existing definition for TABLE 1104.3.2 to:
TABLE 1104.3.2
MAXIMUM PERMISSIBLE QUANTITIES OF REFRIGERANTS
<table>
<tr><th>TYPE OF REFRIGERATION SYSTEM</th><th>MAXIMUM POUNDS FOR VARIOUSOCCUPANCIES</th><th></th><th></th><th></th></tr>
<tr><td></td><td>Institutional</td><td><u>Public Assembly</u></td><td>Residential</td><td>All other occupancies</td></tr>
<tr><td>Sealed absorption system</td><td></td><td></td><td></td><td></td></tr>
<tr><td>In exit access</td><td>0</td><td>0</td><td>3.3</td><td>3.3</td></tr>
<tr><td>In adjacent outdoor locations</td><td>0</td><td>0</td><td>22</td><td>22</td></tr>
<tr><td>In other than exit access</td><td>0</td><td>6.6</td><td>6.6</td><td>6.6</td></tr>
<tr><td>Unit systems</td><td></td><td></td><td></td><td></td></tr>
<tr><td>In other than exit access</td><td>0</td><td>0</td><td>6.6</td><td>6.6</td></tr>
</table>
For SI: 1 pound = 0.454 kg.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>M103-18</td><td>Change existing definition for TABLE 1202.4 and 1202.5 to:
TABLE 1202.4
HYDRONIC PIPE
<table>
<tr><th>MATERIAL</th><th>STANDARD (see Chapter</th></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe</td><td>ASTM D1527; ASTM F2806</td></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC) plastic pipe</td><td>ASTM D2846; ASTM F441; ASTM F442</td></tr>
<tr><td><u>Chlorinated Polyvinyl Chloride/Aluminum/Chlorinated Polyvinyl Chloride (CPVC/AL/CPVC)</u></td><td><u>ASTM F2855</u></td></tr>
<tr><td>Copper or copper-alloy pipe</td><td>ASTM B42; ASTM B43; ASTM B302</td></tr>
<tr><td>Copper or copper-alloy tube (Type K, L or M)</td><td>ASTM B75; ASTM B88; ASTM B135; ASTM B251</td></tr>
<tr><td>Cross-linked polyethylene/ aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe</td><td>ASTM F1281; CSA CAN/CSA-B- 137.10</td></tr>
<tr><td>Cross-linked polyethylene (PEX) tubing</td><td>ASTM F876</td></tr>
<tr><td>Ductile iron pipe</td><td>AWWA C115/A21.15; AWWA C151/A21.51</td></tr>
<tr><td>Lead pipe</td><td>FS WW-P-325B</td></tr>
<tr><td>Polyethylene/aluminum/polyethylene (PE-AL-PE)</td><td>ASTM F1282; CSA B137.9</td></tr>
<tr><td>Polypropylene (PP) plastic pipe</td><td>ASTM F2389</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe</td><td>ASTM D1785; ASTM D2241</td></tr>
<tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM F2623; ASTM F2769; CSA B137.18</td></tr>
<tr><td>Steel pipe</td><td>ASTM A53; ASTM A106</td></tr>
<tr><td>Steel tubing</td><td>ASTM A254</td></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>Gives installers another option.</td></tr>
</table>

Table 1. 2021 IMC Changes Cost Impact

CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	TABLE 1202.5 **HYDRONIC PIPE FITTINGS**					

MATERIAL	STANDARD (see Chapter 15)
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974
Ductile iron and gray iron	ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548
Ductile iron	ANSI/AWWAC153/A21.53
Gray iron	ASTM A126
Malleable iron	ASME B16.3
PE-RT fittings	ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18
PEX fittings	ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159
Plastic	ASTM D2466; ASTM D2467; ASTM D2846; ASTM F438; ASTM F439; ASTM F877; ASTM F2389; ASTM F2735
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548

Solvent-cemented joints. Joint surfaces shall be clean and free of moisture. An approved primer shall be applied to CPVC and PVC pipe-joint surfaces. Joints shall be made while the cement is wet. Solvent cement conforming to the following standards shall be applied to all joint surfaces:

1. ASTM D2235 for ABS joints.
2. ASTM F493 for CPVC joints.
3. ASTM D2564 for PVC joints.

CPVC joints shall be made in accordance with ASTM D2846.

Exception:
For CPVC pipe joint connections, a primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F493.
2. The solvent cement is yellow in color.
3. The solvent cement is used only for joining $^{1}/_{2}$-inch (12.7 mm) through 2-inch (51 mm) diameter CPVC pipe and fittings.
4. The CPVC pipe ~~and~~ or fittings are manufactured in accordance with ASTM D2846.

~~**1203.8**~~ **1203.9 Polybutylene plastic pipe and tubing.** Joints between polybutylene plastic pipe and tubing or fittings shall be mechanical joints conforming to Section 1203.3 or heat-fusion joints conforming to Section ~~1203.8.1.~~1203.9.1.

~~**1203.8.1**~~ **1203.9.1 Heat-fusion joints.** Joints shall be of the socket-fusion or butt-fusion type. Joint surfaces shall be clean

<table>
<tr><th colspan="7">Table 1. 2021 IMC Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IMC CHANGE SUMMARY</th><th colspan="3">IMC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM D3309.
Add new definition for 1203.8 as follows:
<u>1203.8 CPVC/AL/CPVC plastic pipe.</u> <u>Joints between CPVC/AL/CPVC plastic pipes or fittings shall be mechanical, solvent-cemented or threaded joints conforming to Section 1203.3</u></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>M104-18</td><td>Change existing definition for TABLE 1202.4 and 1202.5 to:
TABLE 1202.4
HYDRONIC PIPE
<table>
<tr><th>MATERIAL</th><th>STANDARD (see Chapter</th></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe</td><td>ASTM D1527; ASTM F2806</td></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC) plastic pipe</td><td>ASTM D2846; ASTM F441; ASTM F442</td></tr>
<tr><td>Chlorinated Polyvinyl Chloride/Aluminum/Chlorinated Polyvinyl Chloride (CPVC/AL/CPVC)</td><td>ASTM F2855</td></tr>
<tr><td>Copper or copper-alloy pipe</td><td>ASTM B42; ASTM B43; ASTM B302</td></tr>
<tr><td>Copper or copper-alloy tube (Type K, L or M)</td><td>ASTM B75; ASTM B88; ASTM B135; ASTM B251</td></tr>
<tr><td>Cross-linked polyethylene/ aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe</td><td>ASTM F1281; CSA CAN/CSA-B- 137.10</td></tr>
<tr><td>Cross-linked polyethylene (PEX) tubing</td><td>ASTM F876; <u>ASTM F3253</u></td></tr>
<tr><td>Ductile iron pipe</td><td>AWWA C115/A21.15; AWWA C151/A21.51</td></tr>
<tr><td>Lead pipe</td><td>FS WW-P-325B</td></tr>
<tr><td>Polyethylene/aluminum/polyethylene (PE-AL-PE)</td><td>ASTM F1282; CSA B137.9</td></tr>
<tr><td>Polypropylene (PP) plastic pipe</td><td>ASTM F2389</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe</td><td>ASTM D1785; ASTM D2241</td></tr>
<tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM F2623; ASTM F2769; CSA B137.18</td></tr>
<tr><td>Steel pipe</td><td>ASTM A53; ASTM A106</td></tr>
<tr><td>Steel tubing</td><td>ASTM A254</td></tr>
</table>
TABLE 1202.5
HYDRONIC PIPE FITTINGS
<table>
<tr><th>MATERIAL</th><th>STANDARD (see Chapter 15)</th></tr>
<tr><td>Copper and copper alloys</td><td>ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974</td></tr>
<tr><td>Ductile iron and gray iron</td><td>ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548</td></tr>
<tr><td>Ductile iron</td><td>ANSI/AWWAC153/A21.53</td></tr>
<tr><td>Gray iron</td><td>ASTM A126</td></tr>
<tr><td>Malleable iron</td><td>ASME B16.3</td></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>This new standard also requires a minimum pull-out strength test for the fittings not included in ASTM F877 today.</td></tr>
</table>

Table 1. 2021 IMC Changes Cost Impact

CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	PE-RT fittings: ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18 PEX fittings: ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253 Plastic: ASTM D2466; ASTM D2467; ASTM D2846; ASTM F438; ASTM F439; ASTM F877; ASTM F2389; ASTM F2735 Steel: ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548					
M106-18	Change existing definition for TABLE 1202.5 to: **TABLE 1202.5** **HYDRONIC PIPE FITTINGS** **MATERIAL** / **STANDARD (see Chapter 15)** Copper and copper alloys: ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.24; ASME B16.51; ASSE 1061; ASTM F1974 CPVC: ASSE 1061; ASTM D2846; ASTM F438; ASTM F439 Ductile iron and gray iron: ANSI/AWWA C110/A21.10; AWWA C153/A21.53; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548 Ductile iron: ANSI/AWWA C153/A21.53 Gray iron: ASTM A126 Malleable iron: ASME B16.3 PE-RT fittings: ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18 PEX fittings: ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159 Plastic: ASTM D2466; ASTM D2467; ~~ASTM F438; ASTM F439;~~ ASTM F877; ASTM F2389; ASTM F2735 Steel: ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548		X			Clarification
M107-18	Change existing definition for 1203.14.3 Push-fit joints to: **1203.14.3 Push-fit ~~joints~~ fittings.** Push-fit ~~joints that create a seal on the outside diameter of the tubing shall not be used with tubing that has an ethylene vinyl alcohol copolymer (EVOH) oxygen barrier layer~~ fittings shall comply with ASSE 1061 and be used with PE-RT tubing that is rated for use with such fittings by the tubing manufacturer.		X			Clarification
M108-18	Change existing definition for 1203.9.3 Push-fit joints to: **1203.9.3 Push-fit ~~joints~~ fittings.** Push-fit ~~joints that create a seal on the outside diameter of the tubing shall not~~ fittings shall comply with ASSE 1061 and be used with ~~tubing that has an ethylene vinyl alcohol copolymer (EVOH) oxygen barrier layer~~ PEX tubing that is rated for use with such fittings by the tubing manufacturer.		X			Clarification

Table 1. 2021 IMC Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IMC CHANGE SUMMARY</th><th colspan="3">IMC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td>M109-18</td><td>Change existing definition for TABLE 1210.4, 1210.5, 1210.8 and Chapter 15 to:
TABLE 1210.4
GROUND-SOURCE LOOP PIPE
<table>
<tr><th>MATERIAL</th><th>STANDARD (see Chapter 15)</th></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F441; ASTM F442</td></tr>
<tr><td>Cross-linked polyethylene (PEX)</td><td>ASTM F876; CSA B137.5; CSA C448</td></tr>
<tr><td>Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe</td><td>ASTM F1282; CSA B137.9</td></tr>
<tr><td>High-density polyethylene (HDPE)</td><td>ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1</td></tr>
<tr><td>Polypropylene (PP-R)</td><td>ASTM F2389; CSA B137.11; NSF 358-2</td></tr>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D1785; ASTM D2241</td></tr>
<tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM F2623; ASTM F2769; CSA B137.18; CSA C448</td></tr>
</table>
TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS
<table>
<tr><th>PIPE MATERIAL</th><th>STANDARD (see Chapter 15)</th></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6</td></tr>
<tr><td>Cross-linked polyethylene (PEX)</td><td>ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5; CSA 448</td></tr>
<tr><td>Polyethylene/aluminum/polyethylene (PE-</td><td>ASTM F1282; ASTM F2434; CSA B137.9</td></tr>
<tr><td>High Density Polyethylene (HDPE)</td><td>ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; CSA 448; NSF 358-1</td></tr>
<tr><td>Polypropylene (PP-R)</td><td>ASTM F2389; CSA B137.11; NSF 358-2</td></tr>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3</td></tr>
<tr><td>Raised temperature polyethylene (PE- RT)</td><td>ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18 ; CSA 448</td></tr>
</table>
1210.8 Installation. Piping, valves, fittings, and connections shall be installed in accordance with ANSI/CSA/IGSHPA C448 and the conditions of approval.</td><td></td><td>X</td><td></td><td></td><td>Adding reference to C448 in this row, will indicate that this material is explicitly approved in ANSI/CSA/IGSHPA C448-16.</td></tr>
</table>

Table 1. 2021 IMC Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IMC CHANGE SUMMARY</th><th colspan="3">IMC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td>M109-18</td><td>Change existing definition for TABLE 1210.4, 1210.5, 1210.8 and Chapter 15 to:
<s>Thermal barrier</s> Insulation and thermal break required. Radiant floor heating systems shall be provided with insulation and a thermal <s>barrier</s> break in accordance with Sections 1209.5.1 and 1209.5.2. Insulation R-values for slab-on-grade and suspended floor installation shall be in accordance with the International Energy Conservation Code.
<s>Thermal barrier</s> Insulation material marking. Insulating materials utilized in <s>thermal barriers</s> radiant floor heating systems shall be installed such that the manufacturer's R-value mark is readily observable upon inspection.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>M112-18</td><td>Change existing definition for TABLE 1210.4 and 1210.5 to:
TABLE 1210.4
GROUND-SOURCE LOOP PIPE
<table>
<tr><th>MATERIAL</th><th>STANDARD (see Chapter 15)</th></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F441; ASTM F442</td></tr>
<tr><td>Cross-linked polyethylene (PEX)</td><td>ASTM F876; CSA B137.5; CSA C448</td></tr>
<tr><td>Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe</td><td>ASTM F1282; CSA B137.9</td></tr>
<tr><td>High-density polyethylene (HDPE)</td><td>ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1</td></tr>
<tr><td>Polypropylene (PP-R)</td><td>ASTM F2389; CSA B137.11; NSF 358-2</td></tr>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D1785; ASTM D2241</td></tr>
<tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM F2623; ASTM F2769; CSA B137.18; NSF 358-4</td></tr>
</table>
TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS
<table>
<tr><th>PIPE MATERIAL</th><th>STANDARD (see Chapter 15)</th></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6</td></tr>
<tr><td>Cross-linked polyethylene (PEX)</td><td>ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5</td></tr>
<tr><td>Polyethylene/aluminum/polyethylene (PE-AL-PE)</td><td>ASTM F1282; ASTM F2434; CSA B137.9</td></tr>
<tr><td>High Density Polyethylene (HDPE)</td><td>ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; CSA 448; NSF 358-1</td></tr>
<tr><td>Polypropylene (PP-R)</td><td>ASTM F2389; CSA B137.11; NSF 358-2</td></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>Necessary addition for clarification</td></tr>
</table>

<table>
<tr><th colspan="7">Table 1. 2021 IMC Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IMC CHANGE SUMMARY</th><th colspan="3">IMC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td><table>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3</td></tr>
<tr><td>Raised temperature polyethylene (PE- RT)</td><td>ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18 ; NSF 358-4</td></tr>
</table></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>M113-18</td><td>Change existing definition for TABLE 1210.4 and 1210.5 to:
TABLE 1210.4
GROUND-SOURCE LOOP PIPE
<table>
<tr><th>MATERIAL</th><th>STANDARD (see Chapter 15)</th></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F441; ASTM F442</td></tr>
<tr><td>Cross-linked polyethylene (PEX)</td><td>ASTM F876; CSA B137.5; NSF 358-3</td></tr>
<tr><td>Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe</td><td>ASTM F1282; CSA B137.9</td></tr>
<tr><td>High-density polyethylene (HDPE)</td><td>ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1</td></tr>
<tr><td>Polypropylene (PP-R)</td><td>ASTM F2389; CSA B137.11; NSF 358-2</td></tr>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D1785; ASTM D2241</td></tr>
<tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM F2623; ASTM F2769; CSA B137.18;</td></tr>
</table>
TABLE 1210.5
GROUND-SOURCE LOOP PIPE FITTINGS
<table>
<tr><td>PIPE MATERIAL</td><td>STANDARD (see Chapter 15)</td></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6</td></tr>
<tr><td>Cross-linked polyethylene (PEX)</td><td>ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5; NSF 358-3</td></tr>
<tr><td>Polyethylene/aluminum/polyethylene (PE-AL-PE)</td><td>ASTM F1282; ASTM F2434; CSA B137.9</td></tr>
<tr><td>High Density Polyethylene (HDPE)</td><td>ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; CSA 448; NSF 358-1</td></tr>
<tr><td>Polypropylene (PP-R)</td><td>ASTM F2389; CSA B137.11; NSF 358-2</td></tr>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3</td></tr>
<tr><td>Raised temperature polyethylene (PE- RT)</td><td>ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18</td></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>Provides an additional option.</td></tr>
</table>

Table 1. 2021 IMC Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IMC CHANGE SUMMARY</th><th colspan="3">IMC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td>M114-18</td><td>Change existing definition for TABLE 1210.4 to:
TABLE 1210.4
GROUND-SOURCE LOOP PIPE
<table>
<tr><th>MATERIAL</th><th>STANDARD (see Chapter 15)</th></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe</td><td>ASTM D1527; ASTM F2806</td></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F441; ASTM F442</td></tr>
<tr><td>Copper or copper-alloy pipe</td><td>ASTM B42; ASTM B43; ASTM B302</td></tr>
<tr><td>Copper or copper-alloy tube (Type K, L or M)</td><td>ASTM B75; ASTM B88; ASTM B135; ASTM B251</td></tr>
<tr><td>Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe</td><td>ASTM F1281; CSA CAN/CSA-B-137.10</td></tr>
<tr><td>Cross-linked polyethylene (PEX) tubing</td><td>ASTM F876; CSA B137.5</td></tr>
<tr><td>Ductile iron pipe</td><td>AWWA C115/A21.15; AWWA</td></tr>
<tr><td>Lead pipe</td><td>FS WW-P-325B</td></tr>
<tr><td>Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe</td><td>ASTM F1282; CSA B137.9</td></tr>
<tr><td>Polypropylene (PP) plastic pipe</td><td>ASTM F2389</td></tr>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D1785; ASTM D2241</td></tr>
<tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM F2623; ASTM F2769; CSA B137.18;</td></tr>
<tr><td>Steel pipe</td><td>ASTM A53; ASTM A106</td></tr>
<tr><td>Steel tubing</td><td>ASTM A254</td></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>M116-18</td><td>Change existing definition for 1203.7 to:
1203.7 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be mechanical, solvent-cemented or threaded joints conforming to Section 1203.3.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>M117-18</td><td>Change existing definition for 1210.6.2 to:
1210.6.2 Preparation of pipe ends. Pipe shall be cut square~~, be reamed,~~ and be free of burrs and obstructions. ~~CPVC, PE, and PVC pipe shall be chamfered.~~ Pipe ends shall have full-bore openings and shall ~~not be undercut.~~be prepared in accordance with manufacturer's instructions.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>M118-18</td><td>Change existing definition for 1210.8 to:
1210.8 Installation. Piping, valves, fittings, and connections shall be installed in accordance with the ~~conditions of approval~~ manufacturer's instructions.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>M119-18 Part II</td><td>Change existing definition for 1210.8 to:
M2103.1 Piping materials. Piping for embedment in concrete or gypsum materials shall be standard-weight steel pipe, copper and copper-alloy pipe and tubing, cross-linked</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

<table>
<tr><th colspan="7">Table 1. 2021 IMC Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IMC CHANGE SUMMARY</th><th colspan="3">IMC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe, chlorinated polyvinyl chloride (CPVC), ~~polybutylene,~~ cross-linked polyethylene (PEX) tubing, polyethylene of raised temperature (PE-RT) or polypropylene (PP) with a rating of not less than ~~100~~ 80 psi at 180°F (~~690~~ 552 kPa at 82°C).</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>M120-18</td><td>Change existing definition for TABLE 1302.3 to:
1302.9 ~~Corrugated stainless steel tubing containment~~ Piping systems. ~~Corrugated stainless steel tubing that is factory-installed within a non-metallic containment~~ Aboveground pipe systems shall be listed and labeled in accordance with UL 1369. Underground pipe systems shall be listed and labeled in accordance with ~~or~~ UL 971A.
TABLE 1302.3
FUEL OIL PIPING
<table>
<tr><th>MATERIAL</th><th>STANDARD (see Chapter 15)</th></tr>
<tr><td>Copper or copper-alloy pipe</td><td>ASTM B42; ASTM B43; ASTM B302</td></tr>
<tr><td>Copper or copper-alloy tubing (Type K, L or M)</td><td>ASTM B75; ASTM B88; ASTM B280; ASME B16.51</td></tr>
<tr><td>Labeled pipe</td><td>(See Section 1302.4)</td></tr>
<tr><td>Nonmetallic pipe</td><td>ASTM D2996</td></tr>
<tr><td>Steel pipe</td><td>ASTM A53; ASTM A106</td></tr>
<tr><td>Steel tubing</td><td>ASTM A254; ASTM A539</td></tr>
<tr><td>~~Stainless steel tubing~~</td><td>~~ASTM A240; UL1369; UL971A~~</td></tr>
</table></td><td>X</td><td></td><td></td><td>Minimal</td><td>Clarification</td></tr>
<tr><td>M121-18</td><td>Change existing definition for SECTION 1301, 1302, and 1303 to:
1302.8 Flexible connectors and hoses. Flexible connectors and hoses shall be listed and labeled as being acceptable for the intended application for flammable and combustible liquids in accordance with UL 536.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>M127-18</td><td>Change existing definition for 1402.8.1.2 to:
1402.8.1.2 Rooftop-mounted solar thermal collectors and systems. The roof shall be constructed to support the loads imposed by roof-mounted solar collectors. Where mounted on or above the roof covering, the collector array, ~~stanchions~~ mounting systems and their attachments to the roof shall be constructed of noncombustible materials or fire-retardant-treated wood conforming to the International Building Code to the extent required for the type of roof construction of the building to which the collectors are accessory.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>M128-18</td><td>Change existing definition for 1404.1 to:
1404.1 Collectors. Factory-built solar thermal collectors shall bear a label showing the manufacturer's name and ~~address, model number and~~ serial number or certification number.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 1. 2021 IMC Changes Cost Impact						
CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
ADM6-19	**[Reserved under FBC]** Change existing definition for IMC: [A] 101.2; IPC: [A] 101.2; IEBC: [A] 101.2; and IFGC: [A] 101.2; to: **[A] 101.2 Scope.** This code shall regulate the design, installation, maintenance, *alteration* and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. This code shall also regulate those mechanical systems, system components, *equipment* and appliances specifically addressed herein. The installation of fuel gas distribution piping and *equipment*, fuel gas-fired appliances and fuel gas-fired *appliance* venting systems shall be regulated by the International Fuel Gas Code. **Exception:** Detached one- and two-family dwellings and ~~multiple single-family dwellings (~~ townhouses~~)~~ not more than three stories ~~high~~ above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with this code or the International Residential Code. **[A] 101.2 Scope.** The provisions of this code shall apply to the erection, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of plumbing systems within this jurisdiction. This code shall regulate nonflammable medical gas, inhalation anesthetic, vacuum piping, nonmedical oxygen systems and sanitary and condensate vacuum collection systems. The installation of fuel gas distribution piping and equipment, fuel-gas-fired water heaters and water heater venting systems shall be regulated by the International Fuel Gas Code. Provisions in the appendices shall not apply unless specifically adopted. **Exception:** Detached one- and two-family dwellings and ~~multiple single-family dwellings (~~ townhouses~~)~~ not more than three stories ~~high~~ above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with this code or the International Residential Code. **[A] 101.2 Scope.** The provisions of the this code shall apply to the *repair*, alteration, *change of occupancy*, *addition* to and relocation of *existing buildings*. **Exception:** Detached one- and two-family dwellings and ~~multiple single-family *dwellings*~~ (townhouses~~)~~ not more than three stories above grade plane in height with a separate means of egress, and their accessory structures not more than three		X			Clarification

Table 1. 2021 IMC Changes Cost Impact						
CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	stories above grade plane in height, shall comply with this code or the International Residential Code. **[A] 101.2 Scope.** This code shall apply to the installation of fuel-gas *piping* systems, fuel gas appliances, gaseous hydrogen systems and related accessories in accordance with Sections 101.2.1 through 101.2.5. **Exception:** Detached one- and two-family dwellings and ~~multiple single-family dwellings (~~ townhouses~~)~~ not more than three stories ~~high~~ above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with this code or the International Residential Code.					
ADM9-19 Part I	**[Reserved under FBC]** Change existing definition for IBC: [A] 101.3; IFC: [A] 101.3; IEBC: [A] 101.3; IPC: [A] 101.3; IMC: [A] 101.3; IPSDC: [A] 101.6; IFGC: [A] 101.4; ISPDC: [A] 101.3; IPMC: [A] 101.3; IZC: [A] 101.2; IWUIC: [A] 101.3; ICCPC: [A] 101.4 and [A] 101.4.1 to: **[A] 101.3 ~~Intent.~~ Purpose.** The purpose of this code is to establish minimum ~~standards~~ requirements to provide a reasonable level of safety, health, property protection and ~~public~~ general welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of mechanical equipment or systems.		X			Clarification
ADM16-19 Part I	**[Reserved under FBC]** Change existing definition for IBC: SECTION 103; IFC: SECTION 103; IPC: SECTION 103; IMC: SECTION 103; IFGC: SECTION 103; IEBC: SECTION 103; ISPSC: SECTION 103; IPMC: SECTION 103; IPSDC: SECTION 103 and IWUIC: SECTION 103 to: **2018 International Mechanical Code** **SECTION 103** **~~DEPARTMENT OF BUILDING SAFETY~~ CODE COMPLIANCE AGENCY** **[A] 103.1 ~~General.~~ Creation of agency.** The ~~department of mechanical inspection~~ [INSERT NAME OF DEPARTMENT] is hereby created and the ~~executive~~ official in charge thereof shall be known as the code official. The function of the agency shall be the implementation, administration and enforcement of the provisions of this code. **[A] 103.2 Appointment.** The code official shall be appointed by the chief appointing authority of the jurisdiction.		X			Clarification

Table 1. 2021 IMC Changes Cost Impact						
CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	[A] 103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the code official shall have the authority to appoint a deputy code official, other related technical officers, inspectors and other employees. Such employees shall have powers as delegated by the code official. **[A] ~~103.4~~ 104.8 Liability.** The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered civilly or criminally liable personally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of official duties. **[A] ~~103.4.1~~ 104.8.1 Legal defense.** Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representatives of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code.					
ADM27-19	**[Reserved under FBC]** Add new definition for SECTION 107 FEES, 107.2 Schedule of Permit fees, 107.3 Permit valuations, 107.5 Related fees and 107.6 Refunds as follows: **SECTION 107** **FEES** **107.2 Schedule of permit fees.** Where work requires a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority. **107.3 Permit valuations.** The applicant for a permit shall provide an estimated permit value at time of application. Permit valuations shall include total value of work, including materials and labor, for which the permit is being issued, such as mechanical equipment and permanent systems. If, in the opinion of the code official, the valuation is underestimated on the application, the permit shall be denied, unless the applicant can		X			It helps correlate all the I-Codes together and makes it easier to understand where the requirements are located.

Table 1. 2021 IMC Changes Cost Impact						
CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	show detailed estimates to meet the approval of the code official. Final building permit valuation shall be set by the code official. **107.5 Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law. **107.6 Refunds.** The code official is authorized to establish a refund policy. Change existing definition for [A] 106.5 Fees and [A] 106.5.1 Work commencing before permit issuance to: **[A] ~~106.5~~ 107.1 ~~Fees.~~ Payment of fees.** A permit shall not be ~~issued~~ valid until the fees prescribed ~~in~~ ~~Section 106.5.2~~ by law have been paid.~~, nor shall an~~ An amendment to a permit shall not be released until the additional fee, if any~~, due to an increase of the mechanical system~~, has been paid. **[A] ~~106.5.1~~ 107.4 Work commencing before permit issuance.** Any person who commences any work on a mechanical system before obtaining the necessary permits shall be subject to ~~100 percent of the usual permit fee~~ a fee established by the code official that shall be in addition to the required permit fees. Delete existing definition for [A] 106.5.2 Fee schedule and [A] 106.5.3 Fee refunds.					
ADM28-19	**[Reserved under FBC]** Change existing definition for SECTION 107 to: **SECTION 107** **CONSTRUCTION DOCUMENTS** **[A] ~~106.3.1~~ 107.1 Construction documents.** *Construction documents*, engineering calculations, diagrams and other data shall be submitted in two or more sets with each application for a permit. The code official shall require *construction documents*, computations and specifications to be prepared and designed by a *registered design professional* where required by state law. Where special conditions exist, the code official is authorized to require additional *construction documents* to be prepared by a *registered design professional*. *Construction documents* shall be drawn to scale and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that the work conforms to the provisions of this code. *Construction documents* for buildings more than two stories in height shall indicate where penetrations will be made for mechanical systems, and the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking.		X			Clarification

Table 1. 2021 IMC Changes Cost Impact						
CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Exception: The code official shall have the authority to waive the submission of *construction documents*, calculations or other data if the nature of the work applied for is such that reviewing of *construction documents* is not necessary to determine compliance with this code. **[A] ~~106.4.6~~ 107.2 Retention of construction documents.** One set of *approved construction documents* shall be retained by the code official for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws. One set of *approved construction documents* shall be returned to the applicant, and said set shall be kept on the site of the building or job at all times during which the work authorized thereby is in progress. Change existing definition for SECTION 107 to:					
ADM31-19 Part I	Add new definition for SECTION 108 NOTICE OF APPROVAL as follows: **SECTION 108** **NOTICE OF APPROVAL** Change existing definition for 107.4 Approval and 107.4.1 to: **[A] ~~107.4~~ 108.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. **[A] ~~107.4.1~~ 108.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.		X			Provides consistency through the I- Codes by using standard terminology and it is also consistent with previous actions.
ADM40-19 Part I	**[Reserved under FBC]** Change existing definition for SECTION 109 and 110 to: **SECTION 109** **MEANS OF ~~APPEAL~~ APPEALS** **[A] ~~109.1~~ 109.2 ~~Application for appeal.~~ Limitations on authority.** ~~A person shall have the right to appeal a decision of the code official to the board of appeals.~~ An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply , or an ~~equally good~~ equivalent or better form of construction is proposed. The ~~application shall be filed on a form obtained from the code official within 20 days after the notice was served.~~ board shall not have authority to waive requirements of this code or interpret the administration of this code.		X			Improves the language to correlate all the I-Codes.

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		Decrease	None	Increase		
Sub Code:						
	109.4 Administration The code official shall take immediate action in accordance with the decision of the board. **SECTION 110** **BOARD OF APPEALS** **[A] ~~109.2~~ 110.1 Membership of board.** The board of appeals shall consist of five members appointed by the chief appointing authority as follows: one for 5 years; one for 4 years; one for 3 years; one for 2 years; and one for 1 year. Thereafter, each new member shall serve for 5 years or until a successor has been appointed. Add new definition for SECTION 109.1 General and 109.3 Qualifications as follows: **109.1 General.** In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the code official. **109.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction. Delete existing definition for [A] 109.1.1 Limitation of authority.					
ADM41-19 Part I	**[Reserved under FBC]** Change existing definition for SECTION 115 to: **SECTION 108** **VIOLATIONS** Delete existing definition for [A] 108.5 Stop work orders. Add new definition for SECTION 109 as follows: **SECTION 109** **STOP WORK ORDER** **109.1 Authority.** Where the code official finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the code official is authorized to issue a stop work order. **109.2 Issuance.** The stop work order shall be in writing and shall be given to the owner of the property, the owner's authorized agent or the person performing the work. Upon issuance of a stop		X			Standardizes language and requirements for a stop work order throughout the family of I-Codes.

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CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume. **109.3 Emergencies.** Where an emergency exists, the code official shall not be required to give a written notice prior to stopping the work. **109.4 Failure to comply.** Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fines established by the authority having jurisdiction.					
ADM43-19 Part I	**[Reserved under FBC]** Add new definition for Appendix A as follows: **APPENDIX A** **BOARD OF APPEALS** **SECTION A101** **GENERAL** **A101.1 Scope.** A board of appeals shall be established within the jurisdiction for the purpose of hearing applications for modification of the requirements of this code pursuant to the provisions of Section 109 (Means of Appeals). The board shall be established and operated in accordance with this section, and shall be authorized to hear evidence from appellants and the code official pertaining to the application and intent of this code for the purpose of issuing orders pursuant to these provisions. **A101.2 Application for appeal.** Any person shall have the right to appeal a decision of the code official to the board. An application for appeal shall be based on a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served. **A101.2.1 Limitation of authority.** The board shall not have authority to waive requirements of this code or interpret the administration of this code. **A101.2.2 Stays of enforcement.** Appeals of notice and orders, other than Imminent Danger notices, shall stay the enforcement of the notice and order until the appeal is heard by the board. **A101.3.8 Removal from the board.** A member shall be removed from the board prior to the end of their terms only for cause. Any member with continued absence from regular meeting of the board may be removed at the discretion of the chief appointing authority.		X			Standardizes the language across the I-Codes, provides another tool and gives appropriate guidance as an appendix to establish a board of appeals.

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Sub Code:						
	[A] A101.5.1 Open hearing. All hearings before the board shall be open to the public. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard. **A101.5.2 Quorum.** Three members of the board shall constitute a quorum. **A101.6 Legal counsel.** The jurisdiction shall furnish legal counsel to the board to provide members with general legal advice concerning matters before them for consideration. Members shall be represented by legal counsel at the jurisdiction's expense in all matters arising from service within the scope of their duties. Change existing definitions for [A] 109.2 Membership of board, [A] 109.2.1 Qualifications, [A] 109.2.2 Alternate members, A101.3.3 Vacancies, [A] 109.2.3 Chairman, [A] 109.2.5 Secretary, [A] 109.2.4 Disqualification of member, [A] 109.2.6 Compensation of members, [A] 109.4.1 Procedure, [A] 109.3 Notice of meeting, [A] 109.5 Postponed hearing, [A] 109.6 Board decision, [A] 109.6.1 Resolution, [A] 109.6.2 Administration and [A] 109.7 Court review to: **[A] ~~109.2~~ A101.3 Membership of board.** The board ~~of appeals~~ shall consist of five voting members appointed by the chief appointing authority ~~as follows: one for 5 years; one for 4 years; one for 3 years; one for 2 years; and one for 1 year. Thereafter, each new~~ of the jurisdiction. Each member shall serve for ~~5~~ [INSERT NUMBER OF YEARS] years or until a successor has been appointed. The board member's terms shall be staggered at intervals, so as to provide continuity. The code official shall be an ex officio member of said board but shall not vote on any matter before the board. **[A] ~~109.2.1~~ A101.3.1 Qualifications.** The board ~~of appeals~~ shall consist of five individuals, who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction. ~~one from each of the following professions or disciplines.~~ ~~1. *Registered design professional* who is a registered architect; or a builder or superintendent of building construction with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~ ~~2.*Registered design professional* with structural engineering or architectural experience.~~ ~~3. *Registered design professional* with mechanical and plumbing engineering experience; or a mechanical~~					

Table 1. 2021 IMC Changes Cost Impact						
CODE CHANGE #	2021 IMC CHANGE SUMMARY	IMC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~ ~~4. *Registered design professional* with electrical engineering experience; or an electrical contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~ ~~5. *Registered design professional* with fire protection engineering experience; or a fire protection contractor with not less than 10 years' experience, 5 of which shall have been in responsible charge of work.~~ **[A] ~~109.2.2~~ A101.3.2 Alternate members.** The chief appointing authority ~~shall~~ is authorized to appoint two alternate members who shall be called by the board ~~chairman~~ chairperson to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership, and shall be appointed for ~~5 years,~~ the same term or until a successor has been appointed. **A101.3.3 Vacancies.** Vacancies shall be filled for an unexpired term in the same manner in which original appointments are required to be made. **[A] ~~109.2.3~~ A101.3.4 ~~Chairman.~~ Chairperson.** The board shall annually select one of its members to serve as ~~chairman.~~ chairperson. **[A] ~~109.2.5~~ A101.3.5 Secretary.** The chief ~~administrative officer~~ appointing authority shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings ~~in the office of the chief administrative officer.~~ which shall set forth the reasons for the board's decision, the vote of each member, the absence of a member and any failure of a member to vote. **[A] ~~109.2.4~~ A101.3.6 ~~Disqualification~~ Conflict of ~~member.~~ interest.** A member ~~shall not hear an appeal in which that member has a~~ with any personal, professional or financial interest in a matter before the board shall declare such interest and refrain from participating in discussions, deliberations and voting on such matters. **[A] ~~109.2.6~~ A101.3.7 Compensation of members.** Compensation of members shall be determined by law. **[A] ~~109.4.1~~ A101.4 ~~Procedure.~~ Rules and procedures.** The board shall ~~adopt and make available to the public through the secretary procedures under which a hearing will be conducted.~~ establish policies and procedures necessary to carry out its duties consistent with the provisions of this code and applicable state law. The procedures shall not require compliance with strict					

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	rules of evidence, but shall mandate that only relevant information be ~~received.~~ presented. **[A] ~~109.3~~ A101.5 Notice of meeting.** The board shall meet upon notice from the ~~chairman~~ chairperson, within 10 days of the filing of an appeal, or at stated periodic ~~meetings.~~ intervals. **[A] ~~109.5~~ A101.5.3 Postponed hearing.** When five members are not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing. **[A] ~~109.6~~ A101.7 Board decision.** The board shall only modify or reverse the decision of the code official by a concurring vote of three or more members. **[A] ~~109.6.1~~ A101.7.1 Resolution.** The decision of the board shall be by resolution. ~~Certified copies shall be~~ Every decision shall be promptly filed in writing in the office of the code official within three days and shall be open to the public for inspection. A certified copy shall be furnished to the appellant or the appellant's representative and to the code official. **[A] ~~109.6.2~~ A101.7.2 Administration.** The code official shall take immediate action in accordance with the decision of the board. **[A] ~~109.7~~ A101.8 Court review.** Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.					
F83-18 Part II	Change existing definition for Flammable refrigerants, Special requirements for Group A2L refrigerant machinery rooms and [M] 605.17 Special requirements for Group A2L refrigerant machinery rooms to: **Flammable refrigerants.** Where refrigerants of Groups A2, A3, B2 and B3 are used, the machinery room shall conform to the Class 1, Division 2, hazardous location classification requirements of NFPA 70. **Exceptions:** 1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1106.3. 2. Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 1106.5. **Special requirements for Group A2L refrigerant machinery rooms.** Machinery rooms ~~for~~ with systems containing Group A2L refrigerants ~~shall comply with Sections 1106.5.1 through 1106.5.3.~~		X			Clarification

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	~~**Exception**~~: ~~Machinery rooms conforming to the~~ that do not conform with the Class I, Division 2, hazardous location ~~classification~~ electrical requirements of NFPA 70 ~~are not required to~~, as permitted by Section 1106.4 Exception 2, shall comply with Sections 1106.5.1 ~~and 1106.5.2.~~ through 1106.5.3.					

APPENDIX B

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	**2021 IPC CHANGE SUMMARY**	**IPC COST IMPACT**			**ESTIMATED AMOUNT***	**BENEFIT OF CHANGE**
		Decrease	**None**	**Increase**		
Sub Code:						
P1-18 Part I	Add new definition for: **COPPER ALLOY.** A metal alloy where the principle component ~~homogeneous mixture of not less than two metals where not less than 50% of the finished metal~~ is copper.		X			Necessary addition for clarification
P1-18 Part IV	Add new definition for **COPPER ALLOY.** A homogeneous mixture of not less than two metals where not less than 50% of the finished metal is copper.		X			Necessary addition for clarification
P1-18 Part V	Add new definition for COPPER ALLOY as follows: **COPPER ALLOY**. A homogeneous mixture of not less than two metals where not less than 50% of the finished metal is copper.		X			Necessary addition for clarification
P2-18	Change definition for PUBLIC OR PUBLIC UTILIZATION and PRIVATE to: **PUBLIC OR PUBLIC UTILIZATION.** In the classification of plumbing fixtures, ""public" " applies to fixtures ~~in general toilet rooms of schools, gymnasiums, hotels, airports, bus and railroad stations, public buildings, bars, public comfort stations, office buildings, stadiums, stores, restaurants and other installations where a number of fixtures are installed so that their utilization is similarly unrestricted~~ with unrestricted exposure to walk-in traffic. **PRIVATE.** In the classification of plumbing fixtures, ""private" " applies to fixtures ~~in residences and apartments, and to fixtures in nonpublic toilet rooms of hotels and motels and similar installations in buildings where the plumbing fixtures are intended for utilization by a family or an individual~~ that are not public.	X			Minimal	Clarification
P3-18	Change existing definition for WATER DISPENSER to: **WATER DISPENSER.** A plumbing fixture that is manually controlled by the user for the purpose of dispensing potable drinking water into a receptacle such as a cup, glass or bottle. Such fixture is connected to the potable water distribution system of the premises. ~~This definition includes a freestanding apparatus for the same purpose that is not connected to the potable water distribution system and that is supplied with potable water from a container, bottle or reservoir.~~		X			Clarification
P5-18	**308.2 Piping seismic supports.** Where earthquake loads are applicable in accordance with the International Building Code, plumbing piping supports, anchorage, and bracing shall be designed and installed for seismic forces in accordance with Chapter 16 of the International Building Code.		X			Clarification

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		Decrease	None	Increase		
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P9-18	Change existing definition for 308.9 Parallel water distribution systems to: **308.9 Parallel water distribution systems.** Piping bundles for manifold systems shall be supported in accordance with Table Support at changes in direction shall be in accordance with the manufacturer's instructions. Where hot water piping is bundled with cold ~~or hot~~ water piping, hot water piping shall be insulated in accordance with Section 607.5.		X			Clarification
P11-18 Part II	**P2503.5.1 Rough plumbing.** DWV systems shall be tested on completion of the rough piping installation by water or, air for piping systems other than plastic or, by a vacuum of air for plastic piping systems, without evidence of leakage. ~~Either~~ The test shall be applied to the drainage system in its entirety or in sections after rough-in piping has been installed, as follows: 1. Water test. Each section shall be filled with water to a point not less than 5 feet (1524 mm) above the highest fitting connection in that section, or to the highest point in the completed system. Water shall be held in the section under test for a period of 15 minutes. The system shall prove leak free by visual inspection. 2. Air test. The portion under test shall be maintained at a gauge pressure of 5 pounds per square inch (psi) (34 kPa) or 10 inches of mercury column (34 kPa). This pressure shall be held without introduction of additional air for a period of 15 minutes. 3. Vacuum Test. The portion under test shall be evacuated of air by a vacuum type pump to achieve a uniform gauge pressure of -5 pounds per square inch or a negative 10-inches of mercury column (-34 kPa). This pressure shall be held without the removal of additional air for a period of 15 minutes.	X			Minimal	Clarification
P12-18	**312.10.2 Testing.** Reduced pressure principle, double check, pressure vacuum breaker, reduced pressure detector fire protection, double check detector fire protection, and spill-resistant vacuum breaker backflow preventer assemblies and hose connection backflow preventers shall be tested at the time of installation, immediately after repairs or relocation and at least annually. The testing procedure shall be performed in accordance with one of the following standards: ASSE 5013, ASSE 5015, ASSE 5020, ASSE 5047, ASSE 5048, ASSE 5052, ASSE 5056, CSA B64.10 or CSA B64.10.1. Test gauges shall comply with ASSE 1064.		X			Increased test gauge accuracy
P14-18	**403.1.1 Fixture calculations.** To determine the occupant load of each sex, the total occupant load shall be divided in half. To determine the required number of fixtures, the fixture ratio or		X			Clarification.

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	ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple occupancies, such fractional numbers for each occupancy shall first be summed and then rounded up to the next whole number. ~~**Exception**~~ **Exceptions:** 1. The total occupant load shall not be required to be divided in half where approved statistical data indicates a distribution of the sexes of other than 50 percent of each sex. 2. Where multi-user facilities are designed to serve all genders, the minimum fixture count shall be calculated 100%, based on total occupant load. In such multi-user user facilities, each fixture type shall be in accordance with ICC A117.1 and each urinal that is provided shall be located in a stall.					
P15-18	Change existing definition for 403.2 Separate facilities to: 6. Separate facilities shall not be required where rooms having both water closets and lavatory fixtures are designed for use by both sexes and privacy for water closets are installed in accordance with Section 405.3.4. Urinals shall be located in an area visually separated from the remainder of the facility or each urinal that is provided shall be located in a stall.	X			Minimal	Clarification
P16-18	Change existing definition for 403.1.2 Single-user toilet facility and bathing room fixtures to: **403.1.2 Single-user toilet facility and bathing room fixtures.** The plumbing fixtures located in single- user toilet facilities and bathing rooms, including family or assisted use toilet and bathing rooms that are required by Section 1109.2.1 of the International Building Code, shall contribute toward the total number of required plumbing fixtures for a building or tenant space. Single-user toilet facilities and bathing rooms, and family or assisted-use toilet rooms and bathing rooms shall be identified as being available for use by ~~either~~ all persons regardless of their sex.		X			Clarification
P19-18	Change existing definition for 403.3.1 Access and 403.5 Drinking fountain location to: **403.3.1 Access.** The route to the public toilet facilities required by Section 403.3 shall not pass through kitchens, storage rooms or closets. Access to the required facilities shall be from within the building or from the exterior of the building. ~~Routes shall comply with the accessibility requirements of the International Building~~		X			Clarification

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	~~Code.~~ The public shall have access to the required toilet facilities at all times that the building is occupied. **403.5 Drinking fountain location.** Drinking fountains shall not be required to be located in individual tenant spaces provided that public drinking fountains are located within a distance of travel of 500 feet (152 m) of the most remote location in the tenant space and not more than one story above or below the tenant space. Where the tenant space is in a covered or open mall, such distance shall not exceed 300 feet (91 m). ~~Drinking fountains shall be located on an accessible route.~~					
P21-18	Change existing definition for 403.3.3 Location of toilet facilities in occupancies other than malls to: **403.3.3 Location of toilet facilities in occupancies other than malls.** In occupancies other than covered and open mall buildings, the required public and employee toilet facilities shall be located not more than one story above or below the space required to be provided with toilet facilities, and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m). ~~**Exception**~~ **Exceptions:** 1. The location and maximum distances of travel to required employee facilities in factory and industrial occupancies are permitted to exceed that required by this section, provided that the location and maximum distance of travel are approved. 2. The location and maximum distances of travel to required public and employee facilities in Group S occupancies are permitted to exceed that required by this section, provided that the location and maximum distance of travel are approved	X			Minimal	Clarification
P23-18	Add new definition for 403.6 Service sink location as follows: **403.6 Service sink location.** Service sinks shall not be required to be located in individual tenant spaces in a covered mall provided that service sinks are located within a distance of travel of 300 feet (91 m) of the most remote location in the tenant space and not more than one story above or below the tenant space. Service sinks shall be located on an accessible route.	X			Minimal	Necessary addition for clarification
P24-18	Delete existing definition for 404.3 Exposed pipes and surfaces: ~~**404.3 Exposed pipes and surfaces. Water supply and drain pipes under accessible lavatories and sinks shall be covered or otherwise configured to protect against contact. Pipe coverings shall comply with ASME A112.18.9.**~~		X			Removes an unnecessary definition

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P25-18	Change existing definition for 404.3 Exposed pipes and surfaces to: **404.3 Exposed pipes and surfaces.** Water supply and drain pipes under accessible lavatories and sinks shall be covered or otherwise configured to protect against contact. Pipe coverings shall comply with ASME A112.18.9 or ASTM C1822. Add new standard(s) for ASTM.		X			Allows both the ASME A112 18.9 standard and ASTM C1822 compliance
P27-18	Change existing definition for 405.3.1 Water closets, urinals, lavatories and bidets to: **405.3.1 Water closets, urinals, lavatories and bidets.** A water closet, urinal, lavatory or bidet shall not be set closer than 15 inches (381 mm) from its center to any side wall, partition, vanity or other obstruction. ~~For water closets, urinals, or bidets, where~~ Where partitions or other obstructions do not separate adjacent ~~fixtures,~~ water closets, urinals, or bidets, the fixtures shall not be set closer than 30 inches (762 mm) center to center between adjacent fixtures or adjacent water closets, urinals, or bidets. There shall be not less than a 21-inch (533 mm) clearance in front of a water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall be not less than 30 inches (762 mm) in width and not less than 60 inches (1524 mm) in depth for floor- mounted water closets and not less than 30 inches (762 mm) in width and 56 inches (1422 mm) in depth for wall-hung water closets. **Exception:** An accessible children's water closet shall be set not closer than 12 inches (305 mm) from its center to the required partition or to the wall on one side.		X			Clarification
P30-18	Change existing definition for 405.4.3 Securing wall-hung water closet bowls to: **405.4.3 Securing wall-hung water closet bowls.** Wall-hung water closet bowls shall be supported by a concealed metal carrier that is attached to the building structural members so that strain is not transmitted to the ~~closet~~ fixture connector or any other part of the plumbing system. The carrier shall conform to ASME A112.6.1M or ASME A112.6.2.		X			Adds an optional type of carrier that can be used for securing a water closet bowl to wall.
P31-18	Change existing definition for 407.2 Bathtub waste outlets and overflows to: **407.2 Bathtub waste outlets and overflows.** Bathtubs shall be equipped with a waste outlet ~~and an overflow outlet. The outlets shall be connected to waste tubing or piping~~ that is not less than $1^1/_2$ inches (38 mm) in diameter. The waste outlet shall be equipped with a water-tight stopper. Where an overflow is		X			Clarification

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	installed, the overflow shall be not less than $1^1/_2$inches (38mm) in diameter.					
P32-18	Change existing definition for 408.1 Approval to: **408.1 Approval.** Bidets shall conform to ASME A112.19.2/CSA B45.1. or ASME A112.19.3/CSA B45.4.		X			Clarification
P33-18 Part I	Change existing definition for 408.3 Bidet water temperature to: **408.3 Bidet water temperature.** The discharge water temperature from a bidet fitting shall be limited to not greater than 110°F (43°C) by a water-temperature-limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3.~~		X			Clarification
P33-18 Part I	Change existing definition for P2721.2 Bidet water temperature to: **P2721.2 Bidet water temperature.** The discharge water temperature from a bidet fitting shall be limited to not greater than 110°F (43°C) by a water-temperature-limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3~~.		X			Clarification
P36-18	Change existing definition for 410.1 Approval to: **410.1 Approval.** Drinking fountains shall conform to ASME A112.19.1/CSA B45.2 or ASME A112.19.2/CSA B45.1, or ASME A112.19.3/CSA B45.4 and water coolers shall conform to ASHRAE 18. Drinking fountains, water coolers and water dispensers shall conform to NSF 61, Section 9. Electrically operated, refrigerated drinking water coolers and water dispensers shall be listed and labeled in accordance with UL 399.		X			Clarification
P38-18 Part I	Add new definition for WATER DISPENSER and Substitution to 2018 IBC as follows: **WATER DISPENSER.** A plumbing fixture that is manually controlled by the user for the purpose of dispensing potable drinking water into a receptacle such as a cup, glass or bottle. Such fixture is connected to the potable water distribution system of the premises. This definition includes a freestanding apparatus for the same purpose that is not connected to the potable water distribution system and that is supplied with potable water from a container, bottle or reservoir. **Substitution.** Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies where more than two drinking fountains are required, water dispensers shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.		X			Adds the relevant sections found in IBC to IPC.

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	Change existing definition for Drinking, Minimum number, More than the minimum number, and [P] 2902.6 Small occupancies to: ~~**Drinking**~~ **High and low drinking fountains.** Where drinking fountains are provided on an exterior site, on a floor or within a secured area, the drinking fountains shall be provided in accordance with Sections 1109.5.1 and 1109.5.2. **Minimum number.** Not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons. **Exceptions:** 1. A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains. 2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor. **More than the minimum number.** Where more than the minimum number of drinking fountains specified in Section 1109.5.1 is provided, 50 percent of the total number of drinking fountains provided shall comply with the requirements for persons who use a wheelchair and 50 percent of the total number of drinking fountains provided shall comply with the requirements for standing persons. **Exceptions:** 1. Where 50 percent of the drinking fountains yields a fraction, 50 percent shall be permitted to be rounded up or down, provided that the total number of drinking fountains complying with this section equals 100 percent of the drinking fountains. 2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor. **[P] 2902.6 Small occupancies.** Drinking fountains shall not be required for an occupant load of 15 or fewer.					

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P38-18 Part II	Add new definition for 410.3 High and low drinking fountains and 410.3.2 More than the minimum number as follows: **410.3 High and low drinking fountains.** Where drinking fountains are provided on an exterior site, on a floor or within a secured area, the drinking fountains shall be provided in accordance with Sections 410.3.1 and 410.3.2. **410.3.2 More than the minimum number.** Where more than the minimum number of drinking fountains specified in Section 1109.5.1 is provided, 50 percent of the total number of drinking fountains provided shall comply with the requirements for persons who use a wheelchair and 50 percent of the total number of drinking fountains provided shall comply with the requirements for standing persons. **Exceptions:** 1. Where 50 percent of the drinking fountains yields a fraction, 50 percent shall be permitted to be rounded up or down, provided that the total number of drinking fountains complying with this section equals 100 percent of the drinking fountains. 2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor. Change existing definition for [BE] 410.3 High and low drinking fountains and 410.4 Substitution to: **[BE] ~~410.3~~ 410.3.1 ~~High and low drinking fountains~~ Minimum number.** ~~Where drinking fountains are required, not~~ Not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons. **Exceptions:** 1. A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains. 2. Where drinking fountains are primarily for children's use, the drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762		X			Adds the relevant sections found in IBC to IPC.

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	mm) minimum above the floor. **410.4 Substitution.** Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies where more than two drinking fountains are required, *water dispensers* shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.					
P39-18	Change existing definition for 410.4 Substitution and [BE] 410.3 High and low drinking fountains to: **410.4 Substitution.** Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies where three or more drinking fountains are required, water dispensers shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains. **[BE] 410.3 High and low drinking fountains.** Where drinking fountains are required, not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons. **Exceptions:** 1. A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains. 2. Where drinking fountains are primarily for children's use, the drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.		X			Clarification
P42-18	Change existing definition for 411.3 Water supply to: **411.3 Water supply.** Where hot and cold water is supplied to an emergency shower or eyewash station, the temperature of the water supply shall only be controlled by a temperature actuated mixing valve complying with ASSE 1071. Where water is supplied directly to an emergency shower or eyewash station from a water heater, the water heater shall comply with ASSE 1085.	X			Minimal	Clarification
P44-18 Part I	Change existing definition for 412.3 Individual shower valves, 412.4 Multiple (gang) showers, and 412.5 Bathtub and whirlpool bathtub valves to: **412.3 Individual shower valves.** Individual shower and tubshower combination valves shall be balanced-pressure,		X			Clarification

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	thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 ~~and~~ . Such valves shall be installed at the point of use. Shower and tub-shower combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions to provide water at a temperature not to exceed 120ºF. In-line thermostatic valves shall not be utilized for compliance with this section. **412.4 Multiple (gang) showers.** Multiple (gang) showers supplied with a single-tempered water supply pipe shall have the water supply for such showers controlled by an approved automatic temperature control mixing valve that conforms to ASSE 1069 or CSA B125.3, or each shower head shall be individually controlled by a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valve that conforms to ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and that is installed at the point of use. Such valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturers' instructions to provide water at a temperature not to exceed 120ºF. Access shall be provided to a ASSE 1069 or CSA B125.3 valve. **412.5 Bathtub and whirlpool bathtub valves.** ~~The hot water supplied to bathtubs~~ Bathtubs and whirlpool ~~bathtubs~~ bathtub valves shall ~~be limited to not greater than 120°F (49°C)~~ have or be supplied by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3, except where such ~~protection is otherwise provided by a~~ valves are combination tub/shower ~~valve~~ valves in accordance with Section 412.3. The water temperature3 limiting device required by this section shall be equipped with a means to limit the maximum setting of the device to 120ºF (49ºC), and, where adjustable, shall be field adjusted in accordance with the manufacturer's instructions to provide hot water at a temperature not to exceed (120ºF (49ºC). Access shall be provided to water temperature limiting devices that conform to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3. **Exception:** Access is not required for non-adjustable water temperature limiting devices that conform to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 and are integral with a					

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Sub Code:						
	fixture fitting, provided that the fixture fitting itself can be accessed for replacement.					
P44-18 Part II	Change existing definition for P208.4 Shower control valves and P2713.3 Bathtub and whirlpool bathtub valves to: **P2708.4 Shower control valves.** Individual shower and ~~tub/shower~~ tubshower combination valves shall be ~~equipped with control valves of the pressure-balance~~ balanced-pressure, thermostatic ~~-mixing~~ or combination balanced-pressure-~~balance/thermostatic-mixing valve types with a high limit stop in accordance with~~ /thermostatic valves that conform to the requirements of ASSE 1016/ASME A112.1016/CSA B125.16~~. The high limit stop shall be set to limit the water temperature to not greater than 120°F (49°C).~~ or ASME A112.18.1/CSA B125.1. Such valves shall be installed at the point of use. Shower and tub-shower combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions to provide water at a temperature not to exceed 120ºF. In-line thermostatic valves shall not be ~~used~~ utilized for compliance with this section. **P2713.3 Bathtub and whirlpool bathtub valves.** ~~Hot water supplied to bathtubs~~ Bathtubs and whirlpool ~~bathtubs~~ bathtub valves shall ~~be limited to a temperature of not greater than 120°F (49°C)~~ have or be supplied by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3, except where such ~~protection is otherwise provided by a~~ valves are combination tub/shower ~~valve~~ valves in accordance with Section P2708.4. The water temperature3 limiting device required by this section shall be equipped with a means to limit the maximum setting of the device to 120ºF (49ºC), and, where adjustable, shall be field adjusted in accordance with the manufacturer's instructions to provide hot water at a temperature not to exceed 120ºF (49ºC). Access shall be provided to water temperature limiting devices that conform to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3. **Exception:** Access is not required for non-adjustable water temperature limiting devices that conform to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 and are integral with a fixture fitting, provided that the fixture fitting itself can be accessed for replacement.		X			Clarification
P46-18 Part I	Change existing definition for 412.3 Individual shower valves and 412.4 Multiple (gang) showers to:		X			Clarification

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	412.3 Individual shower valves. Individual shower and tub shower combination valves shall be balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and shall be installed at the point of use. Shower control valves shall be rated for the flow rate of the installed showerhead. Shower and tub-shower combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions. In-line thermostatic valves shall not be utilized for compliance with this section. **412.4 Multiple (gang) showers.** Multiple (gang) showers supplied with a single-tempered water supply pipe shall have the water supply for such showers controlled by an approved automatic temperature control mixing valve that conforms to ASSE 1069 or CSA B125.3, or each shower head shall be individually controlled by a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valve that conforms to ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and is installed at the point of use. Where a showerhead is individually controlled, shower control valves shall be rated for the flow rate of the installed showerhead. Such valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturers' instructions.					
P46-18 Part II	Change existing definition for P2708.4 Shower control valves to: **P2708.4 Shower control valves.** Individual shower and tub/shower combination valves shall be equipped with control valves of the pressure-balance, thermostatic-mixing or combination pressure- balance/thermostatic-mixing valve types with a high limit stop in accordance with ASSE 1016/ASME A112.1016/CSA B125.16. Shower control valves shall be rated for the flow rate of the installed showerhead. The high limit stop shall be set to limit the water temperature to not greater than 120°F (49°C). In-line thermostatic valves shall not be used for compliance with this section.		X			Clarification
P47-18 Part I	Change existing definition for 412.5 Bathtub and whirlpool bathtub valves to: **412.5 Bathtub and whirlpool bathtub valves.** The hot water supplied to bathtubs and whirlpool bathtubs shall be limited to not greater than 120°F (49°C) by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA		X			Clarification

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	B125.70 ~~or CSA B125.3~~, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section 412.3.					
P47-18 Part II	Change existing definition for P2713.3 Bathtub and whirlpool bathtub valves to: **P2713.3 Bathtub and whirlpool bathtub valves.** Hot water supplied to bathtubs and whirlpool bathtubs shall be limited to a temperature of not greater than 120°F (49°C) by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3~~, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section P2708.4.		X			Clarification
P48-18 Part I	Change existing definition for 412.5 Bathtub and whirlpool bathtub valves to: **412.5 Bathtub and whirlpool bathtub valves.** The hot water supplied to bathtubs and whirlpool bathtubs shall be limited to not greater than 120°F (49°C) by a water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 or by a water heater complying with ASSE 1082 or ASSE 1084, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section 412.3. 1082-2018: Performance Requirements for Water Heaters Used as Temperature Control Devices for Hot Water Distribution Systems.		X			Including a standard in the code will make these devices safer.
P51-18	Change existing definition for 412.10 Head shampoo sink faucets to: **412.10 Head shampoo sink faucets.** Head shampoo sink faucets shall be supplied with hot water that is limited to not more than 120°F (49°C) . Each faucet shall have integral check valves to prevent crossover flow between the hot and cold water supply connections. The means for regulating the maximum temperature shall be one of the following: 1. ~~A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70.~~ 2.~~2. A thermostatic mixing valve conforming to ASSE 1017.~~ ~~3~~ 2. ~~A water heater conforming to ASSE 1082. 4. A water heater conforming to ASSE 1084.~~ ~~5~~ 3. A temperature actuated flow reduction device conforming to ASSE 1062.	X			Minimal	Clarification
P52-18	Add new definition for 412.11 Pre-rinse spray valve to:		X			Necessary addition for clarification

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	412.11 Pre-rinse spray valve. Pre-rinse spray valves for commercial food service shall conform to ASME A112.18.1/CSA B125.1.					
P54-18	Change existing definition for 416.1 Approval to: **416.1 Approval.** Domestic food waste disposers shall conform to ASSE 1008 and shall be listed and labeled in accordance with UL 430. Commercial food waste disposers shall be listed and labeled in accordance with UL 430. Food waste disposers shall not increase the drainage fixture unit load on the sanitary drainage system.		X			Clarification
P55-18	Add new definition for GROUP WASH FIXTURE to: **GROUP WASH FIXTURE.** A type of lavatory that allows more than one person to utilize the fixture at the same time. The fixture has one or more drains and one or more faucets. Change existing definition for 419.1 Approval and 419.3 Lavatory waste outlets to: **419.1 Approval.** Lavatories shall conform to ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. Group wash ~~-up equipment~~ fixtures shall conform to the requirements of Section 402. ~~Every~~ For determining the number of lavatories required by Table 403.1, every 20 inches (508 mm) of rim space of a group wash fixture shall be considered as one lavatory. **419.3 Lavatory waste outlets.** Lavatories and group wash fixtures shall have a waste ~~outlets~~ outlet not less than $1^1/_4$ inches (32 mm) in diameter. A strainer, pop-up stopper, crossbar or other device shall be provided to restrict the clear opening of the waste outlet.		X			Clarification
P57-18	Change existing definition for 419.5 Tempered water for public hand-washing facilities to: **Tempered water for public hand-washing facilities.** Tempered water shall be delivered from lavatories and group wash fixtures located in public toilet facilities provided for customers, patrons and visitors. Tempered water shall be delivered through an approved water-temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3~~.		X			Clarification
P58-18 Part II	Change existing definition for [MP] HOT WATER to: **[MP] HOT WATER.** Water at a temperature greater than ~~or equal to 110°F (43°C).~~120°F (49°C).		X			Clarification
P62-18	Change existing definition for 421.1 Approval to: **421.1 Approval.** Prefabricated showers and shower compartments shall conform to ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA		X			Clarification

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	B45.5/IAPMO Z124. Shower valves for individual showers shall conform to the requirements of Section 412.3.					
P63-18 Part I	Add new definition for 421.3.1 Waste Fittings to: **421.3.1 Waste Fittings.** Waste fittings shall conform to ASME A112.18.2/CSA B125.2.		X			Necessary addition for clarification
P63-18 Part II	Add new definition for P2708.2.1 Waste Fittings to: **P2708.2.1 Waste Fittings.** Waste fittings shall conform to ASME A112.18.2/CSA B125.2.		X			Necessary addition for clarification
P66-18	Change existing definition for 423.3 Footbaths and pedicure baths to: **423.3 Footbaths and pedicure baths.** The water supplied to specialty plumbing fixtures, such as pedicure chairs having an integral foot bathtub and footbaths, shall be limited to not greater than 120°F (49°C) by a water-temperature-limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 or CSA B125.3 or from a water heater complying with ASSE 1082 ~~or ASSE 1084~~.		X			Clarification
P67-18	Change existing definition for 423.3 Footbaths and pedicure baths to: **423.3 Footbaths and pedicure baths.** The water supplied to specialty plumbing fixtures, such as pedicure chairs having an integral foot bathtub and footbaths, shall be limited to not greater than 120°F (49°C) by a water-temperature-limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 ~~or CSA B125.3~~.		X			Clarification
P68-18	Change existing definition for 425.1 Approval to: **Approval.** Water closets shall conform to the water consumption requirements of Section 604.4 and shall conform to ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. ~~Water closets shall conform to the hydraulic performance requirements of ASME A112.19.2/CSA B45.1. Water closet tanks shall conform to ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. Electro-hydraulic water closets shall comply with ASME A112.19.2/CSA B45.1. Water closets equipped with a dual flushing device shall comply with ASME A112.19.14.~~ Add new definition for DUAL FLUSHING DEVICE, 425.1.1 Hydraulic performance, 425.1.2 Water closet tanks, and 425.1.3 Dual flush water closets to: **DUAL FLUSHING DEVICE.** A feature that allows the user to flush a water closet with either a reduced or full volume of water depending upon bowl contents.		X			Clarification

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	425.1.1 Hydraulic performance. Water closets shall conform to the hydraulic performance requirements of ASME A112.19.2/CSA B45.1. **425.1.2 Water closet tanks.** Water closet tanks shall conform to ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. **425.1.3 Dual flush water closets.** Water closets equipped with a dual flushing device shall comply with ASME A112.19.14.					
P69-18	Change existing definition for 501.2 Water heater as space heater to: **501.2 Water heater as space heater.** Where a combination potable water heating and space heating system requires water for space heating at temperatures greater than 140°F (60°C), a master thermostatic mixing valve complying with ASSE 1017 shall be provided to limit the water supplied to the potable hot water distribution system to a temperature of 140°F (60°C) or less. The potability of the water shall be maintained throughout the system. Requirements for combination potable water heating and space heating systems shall be in accordance with the International Mechanical Code.		X			Clarification
P71-18 Part I	Change existing definition for 501.2 Water heater as space heater and 607.2.2 Piping for recirculation systems having master thermostatic to: **501.2 Water heater as space heater.** Where a combination potable water heating and space heating system requires water for space heating at temperatures greater than 140°F (60°C), a ~~master thermostatic~~ temperature-actuated mixing valve complying with ASSE 1017 shall be provided to limit the water supplied to the potable hot water distribution system to a temperature of 140°F (60°C) or less. The potability of the water shall be maintained throughout the system. **607.2.2 Piping for recirculation systems having ~~master thermostatic~~ temperature-actuated mixing valves.** Where a ~~thermostatic~~ temperature-actuated mixing valve is used in a system with a hot water recirculating pump, the hot water or tempered water return line shall be routed to the cold water inlet pipe of the water heater and the cold water inlet pipe or the hot water return connection of the ~~thermostatic~~ temperature-actuated mixing valve.		X			Clarification
P71-18 Part II	Change existing definition for P2802.1 Water temperature control and P2803.2 Temperature control to: **P2802.1 Water temperature control.** Where heated water is discharged from a solar thermal system to a hot water distribution system, a ~~thermostatic~~ temperature-actuated mixing		X			Clarification

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	valve complying with ASSE 1017 shall be installed to temper the water to a temperature of not greater than 140°F (60°C). Solar thermal systems supplying hot water for both space heating and domestic uses shall comply with Section P2803.2. A temperature-indicating device shall be installed to indicate the temperature of the water discharged from the outlet of the mixing valve. The ~~thermostatic~~ temperature-actuated mixing valve required by this section shall not be a substitute for water-temperature limiting devices required by Chapter 27 for specific fixtures. **P2803.2 Temperature control.** Where a combination water heater-space heating system requires water for space heating at temperatures exceeding 140°F (60°C), a ~~master thermostatic~~ temperature-actuated mixing valve complying with ASSE 1017 shall be installed to temper the water to a temperature of not greater than 140°F (60°C) for domestic uses.					
P77-18 Part I	Change existing definition for 602.3.5 Pumps to: **602.3.5 Pumps.** Pumps shall be rated for the transport of potable water. Pumps in an individual water supply system shall be constructed and installed so as to prevent contamination from entering a potable water supply through the pump units. Pumps intended to supply drinking water shall conform to NSF 61. Pumps shall be sealed to the well casing or covered with a water-tight seal. Pumps shall be designed to maintain a prime and installed such that ready access is provided to the pump parts of the entire assembly for repairs.		X			Clarification
P77-18 Part II	Change existing definition for P2903.3.1 Pumps handling drinking water to: **P2903.3.1 Pumps handling drinking water.** Pumps intended to supply drinking water shall conform to NSF 61.		X			Clarification
P79-18 Part II	Change existing definition for P2903.1 Water supply system design criteria to: **P2903.1 Water supply system design criteria.** The water service and water distribution systems shall be designed and ~~pipe sizes shall be selected such that under conditions of~~ sized for peak demand, ~~the capacities at the point of outlet discharge shall be not less than~~ using values shown in Table P2903.1. **TABLE P2903.1** **~~REQUIRED CAPACITIES AT POINT OF OUTLET DISCHARGE~~ FLOW RATE AND PRESSURES FOR DESIGNING PIPING SYSTEMS**		X			Clarification
P83-18	Change existing definition for TABLE 605.3 WATER SERVICE PIPE to: **TABLE 605.3** **WATER SERVICE PIPE**		X			Adding another standard for

Table 2. 2021 IPC Changes Cost Impact

<table>
<tr><th>CODE CHANGE #</th><th>2021 IPC CHANGE SUMMARY</th><th colspan="3">IPC COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th></th><th></th><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td></td><td>
<table>
<tr><th>MATERIAL</th><th>STANDARD</th></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe</td><td>ASTM D1527; ASTM D2282</td></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC) plastic pipe</td><td>ASTM D2846; ASTM F441; ASTM F442; CSA B137.6</td></tr>
<tr><td>Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC)</td><td>ASTM F2855</td></tr>
<tr><td>Copper or copper-alloy pipe</td><td>ASTM B42; ASTM B302</td></tr>
<tr><td>Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM)</td><td>ASTM B75; ASTM B88; ASTM B251; ASTM B447</td></tr>
<tr><td>Cross-linked polyethylene (PEX) plastic pipe and tubing</td><td>ASTM F876; AWWA C904; CSA B137.5</td></tr>
<tr><td>Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL- PEX) pipe</td><td>ASTM F1281; ASTM F2262; CSA B137.10</td></tr>
<tr><td>Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)</td><td>ASTM F1986</td></tr>
<tr><td>Ductile iron water pipe</td><td>AWWA C151/A21.51; AWWA C115/A21.15</td></tr>
<tr><td>Galvanized steel pipe</td><td>ASTM A53</td></tr>
<tr><td>Polyethylene (PE) plastic pipe</td><td>ASTM D2239; ASTM D3035; AWWA C901; CSA B137.11</td></tr>
<tr><td>Polyethylene (PE) plastic tubing</td><td>ASTM D2737; AWWA C901; CSA B137.1</td></tr>
<tr><td>Polyethylene/aluminum/polethylene (PE-AL-PE) pipe</td><td>ASTM F1282; CSA B137.9</td></tr>
<tr><td>Polyethylene of raised temperature (PE-RT) plastic tubing</td><td>ASTM F2769; CSA B137.18</td></tr>
<tr><td>Polypropylene (PP) plastic pipe or tubing</td><td>ASTM F2389; CSA B137.11</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe</td><td>ASTM D 1785; ASTM D2241; ASTM D2672; CSA B137.3</td></tr>
<tr><td>Stainless steel pipe (Type 304/304L)</td><td>ASTM A269, ASTM A312; ASTM A778</td></tr>
<tr><td>Stainless steel pipe (Type 316/316L)</td><td>ASTM A269, ASTM A312; ASTM A778</td></tr>
</table>
</td><td></td><td></td><td></td><td></td><td>stainless steel piping into the code increases flexibility in choices of piping.</td></tr>
<tr><td>P84-18</td><td>Change existing definition for TABLE 605.3 WATER SERVICE PIPE to:
TABLE 605.3
WATER SERVICE PIPE
<table>
<tr><th>MATERIAL</th><th>STANDARD</th></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe</td><td>ASTM D1527; ASTM D2282</td></tr>
</table>
</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 2. 2021 IPC Changes Cost Impact

CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Chlorinated polyvinyl chloride (CPVC) plastic pipe — ASTM D2846; ASTM F441; ASTM F442; CSA B137.6					
	Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC) — ASTM F2855					
	Copper or copper-alloy pipe — ASTM B42; ASTM B43, ASTM B302,					
	Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM) — ASTM B75; ASTM B88; ASTM B251; ASTM B447					
	Cross-linked polyethylene (PEX) plastic pipe and tubing — ASTM F876; AWWA C904; CSA B137.5					
	Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL- PEX) pipe — ASTM F1281; ASTM F2262; CSA B137.10					
	Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE) — ASTM F1986					
	Ductile iron water pipe — AWWA C151/A21.51; AWWA C115/A21.15					
	Galvanized steel pipe — ASTM A53					
	Polyethylene (PE) plastic pipe — ASTM D2239; ASTM D3035; AWWA C901; CSA B137.11					
	Polyethylene (PE) plastic tubing — ASTM D2737; AWWA C901; CSA B137.1					
	Polyethylene/aluminum/polethylene (PE-AL-PE) pipe — ASTM F1282; CSA B137.9					
	Polyethylene of raised temperature (PE-RT) plastic tubing — ASTM F2769; CSA B137.18					
	Polypropylene (PP) plastic pipe or tubing — ASTM F2389; CSA B137.11					
	Polyvinyl chloride (PVC) plastic pipe — ASTM D 1785; ASTM D2241; ASTM D2672; CSA B137.3					
	Stainless steel pipe (Type 304/304L) — ASTM A312; ASTM A778					
	Stainless steel pipe (Type 316/316L) — ASTM A312; ASTM A778					
P86-18	Change existing definition for TABLE 605.5 PIPE FITTINGS to: **TABLE 605.5** **PIPE FITTINGS** **MATERIAL** | **STANDARD**		X			Provides a reference standard for Stainless Steel Press-

Table 2. 2021 IPC Changes Cost Impact

CODE CHANGE #	2021 IPC CHANGE SUMMARY		IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
	Acrylonitrile butadiene styrene (ABS) plastic	ASTM D2468					Connect Fittings and provide an additional Press-connect standard for Copper and copper alloy fittings.
	Cast iron	ASME B16.4					
	Chlorinated polyvinyl chloride (CPVC) plastic	ASSE 1061; ASTM D2846; ASTM F437; ASTM F 438; ASTM F439; CSA B137.6					
	Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1476; ASTM F1548; ASTM F3226					
	Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE)	ASTM F1986					
	Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061, ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098, ASTM F2159; ASTM F2434; ASTM F2735; CSA B137.5					
	Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061, ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.18					
	Gray iron and ductile iron	ASTM F1476; ASTM F1548; AWWA C110/A21.10; AWWA C153/A21.53;					
	Insert fittings for polyethylene/aluminum/polyethylene (PE- AL-PE) and cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974; ASTM F1281; ASTM F1282; CSA B137.9; CSA B137.10					
	Malleable iron	ASME B16.3					
	Metal (brass) insert fittings for polyethylene/aluminum/polyethylene (PE-AL-PE) and cross- linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX)	ASTM F1974					
	Polyethylene (PE) plastic pipe	ASTM D2609; ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1					
	Polypropylene (PP) plastic pipe or tubing	ASTM F2389; CSA B137.11					
	Polyvinyl chloride (PVC) plastic	ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3					
	Stainless steel (Type 304/304L)	ASTM A312; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226					

Table 2. 2021 IPC Changes Cost Impact

<table>
<tr><th>CODE CHANGE #</th><th>2021 IPC CHANGE SUMMARY</th><th colspan="3">IPC COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th></th><th></th><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td></td><td><table>
<tr><td>Stainless steel (Type 316/316L)</td><td>ASTM A312; ASTM A778; ASTM F1476; ASTM F1548; ASTM F3226</td></tr>
<tr><td>Steel</td><td>ASME B16.9; ASME B16.11; ASME B16.28; ASTM F1476; ASTM F1548</td></tr>
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<tr><td>P87-18 Part II</td><td>Change existing definition for TABLE P2906.6 PIPE FITTINGS to:
TABLE P2906.6
PIPE FITTINGS<table>
<tr><th>MATERIAL</th><th>STANDARD</th></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic</td><td>ASTM D2468</td></tr>
<tr><td>Cast-iron</td><td>ASME B16.4</td></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC) plastic</td><td>ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6</td></tr>
<tr><td>Copper or copper alloy</td><td>ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F3226</td></tr>
<tr><td>Cross-linked polyethylene/aluminum/high-density polyethylene (PEX- AL-HDPE)</td><td>ASTM F1986</td></tr>
<tr><td>Fittings for cross-linked polyethylene (PEX) plastic tubing</td><td>ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM F2434; ASTM F2735; CSA B137.5</td></tr>
<tr><td>Gray iron and ductile iron</td><td>AWWA C110/A21.10; AWWA C153/A21.53</td></tr>
<tr><td>Malleable iron</td><td>ASME B16.3</td></tr>
<tr><td>Insert fittings for Polyethylene/aluminum/polyethylene (PE- AL-PE) and cross-linked polyethylene/aluminum/cross- linked polyethylene (PEX-AL-PEX)</td><td>ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10</td></tr>
<tr><td>Polyethylene (PE) plastic</td><td>ASTM D 2609; CSA B137.1</td></tr>
<tr><td>Fittings for polyethylene of raised temperature (PE-RT) plastic tubing</td><td>ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F 2159; ASTM F2735; ASTM F2769; CSA B137.18</td></tr>
<tr><td>Polypropylene (PP) plastic pipe or tubing</td><td>ASTM F2389; CSA B137.11</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic</td><td>ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3</td></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>Add ASTM standard for press-connect joint fittings to the IRC</td></tr>
</table>

Table 2. 2021 IPC Changes Cost Impact							
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Stainless steel (Type 304 / 304L) pipe — ASTM A312; ASTM A778 Stainless steel (Type 316 / 316L) pipe — ASTM A312; ASTM A778 Steel — ASME B16.9; ASME B16.11; ASME B16.28					
P88-18 Part I	Change existing definition for 605.12.3 Solder joints and 605.13.6 Solder joints to: **605.12.3 Solder joints.** Solder joints shall be made in accordance with ASTM B828. Cut tube ends shall be reamed to the full inside diameter of the tube end. Joint surfaces shall be cleaned. A flux conforming to ASTM B813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B32. The joining of water supply piping shall be made with lead-free solder and fluxes. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead. Solder and flux joining pipe or fittings intended to supply drinking water shall conform to NSF 61. **605.13.6 Solder joints.** Solder joints shall be made in accordance with the methods of ASTM B828. Cut tube ends shall be reamed to the full inside diameter of the tube end. Joint surfaces shall be cleaned. A flux conforming to ASTM B813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B32. The joining of water supply piping shall be made with lead-free solder and flux. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead. Solder and flux joining pipe or fittings intended to supply drinking water shall conform to NSF 61.		X			Clarification
P88-18 Part II	Change existing definition for 605.12.3 Solder joints and 605.13.6 Solder joints to: **P2906.15 Soldered and brazed joints.** Soldered joints in copper and copper alloy tubing shall be made with fittings approved for water piping and shall conform to ASTM B828. Surfaces to be soldered shall be cleaned bright. Fluxes for soldering shall be in accordance with ASTM B813. Brazing fluxes shall be in accordance with AWS A5.31M/A5.31. Solders and fluxes used in potable water-supply systems shall have a lead content of not greater than 0.2 percent. Solder and flux joining pipe or fittings intended to supply drinking water shall conform to NSF 61.		X			Clarification
P89-18 Part I	Change existing definition for 605.13.7 Push-fit joints to: **605.13.7 Push-fit fitting joints.** Push-fit fittings joints shall conform to ASSE 1061 and shall be installed in accordance with the manufacturer's instructions.		X			Clarification

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
P89-18 Part Ii	Change existing definition for P2906.21 Push-fit joints to: **P2906.21 Push-fit fitting joints.** Push-fit fittings joints shall be used only on copper-tube-size outside diameter dimensioned CPVC, PEX and copper tubing. Push-fit fittings joints shall conform to ASSE 1061 and shall be installed in accordance with the manufacturer's instructions.		X			Clarification
P91-18	Change existing definition for 606.1 Location of full-open valves: **606.1 Location of full-open valves.** Full-open valves shall be installed in the following locations: 1. On the building water service pipe from the public water supply near the curb. 2. On the water distribution supply pipe at the entrance into the structure. 2.1. In multiple tenant buildings, where a common water supply piping system is installed to supply other than one and two family dwellings, a main shutoff valve shall be provided for each tenant. 3. On the discharge side of every water meter. 4. On the base of every water riser pipe in occupancies other than multiple-family residential occupancies that are two stories or less in height and in one- and two-family residential occupancies. 5. On the top of every water down-feed pipe in occupancies other than one- and two-family residential occupancies. 6. On the entrance to every water supply pipe to a dwelling unit, except where supplying a single fixture equipped with individual stops. 7. On the water supply pipe to a gravity or pressurized water tank. 8. On the water supply pipe to every water heater.			X	Minimal	Clarification
P93-18	Delete existing definition for 606.7 Labeling of water distribution pipes in bundles.	X			Minimal	Clarification
P96-18	Change existing definition for 607.1.1 Temperature limiting means to: **607.1.1 Temperature limiting means.** A thermostat control for a water heater shall only serve as the temperature limiting means for the purposes of complying with the requirements of this code for maximum allowable hot or tempered water delivery temperature at fixtures where the water heater complies with ASSE 1082, ~~ASSE 1084,~~ or ASSE 1085.	X			Minimal	Clarification
P97-18 Part I	Change existing definition for 608.14.3 Backflow preventer with intermediate atmospheric vent, 608.17.2 Connections to boilers, and TABLE 608.1 APPLICATION OF BACKFLOW PREVENTERS to:		X			ASSE 1081 covers devices that have

Table 2. 2021 IPC Changes Cost Impact

CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	608.14.3 Backflow preventer with intermediate atmospheric vent. Backflow preventers with intermediate atmospheric vents shall conform to ASSE 1012, ASSE 1081, or CSA B64.3. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge by air gap and shall be prevented from being submerged. **608.17.2 Connections to boilers.** The potable supply to the boiler shall be equipped with a backflow preventer with an intermediate atmospheric vent complying with ASSE 1012, ASSE 1081, or CSA B64.3. Where conditioning chemicals are introduced into the system, the potable water connection shall be protected by an air gap or a reduced pressure principle backflow preventer, complying with ASSE 1013, CSA B64.4 or AWWA C511.					combined products compliant to both ASSE 1003 and ASSE 1012.

TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

DEVICE	DEGREE OF HAZARD a	APPLICATION[b]	APPLICABLE STANDARDS
Backflow prevention assemblies:			
Double check backflow prevention assembly and double check fire protection backflow prevention assembly	Low hazard	Backpressure or backsiphonage Sizes 3/8″– 16″	ASSE 1015, AWWA C510, CSA B64.5, CSA B64.5.1
Double check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes 2″–16″	ASSE 1048
Pressure vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes 1/2 ″–2″	ASSE 1020, CSA B64.1.2
Reduced pressure principle backflow prevention assembly and reduced pressure principle fire protection backflow assembly	High or low hazard	Backpressure or backsiphonage Sizes 3/8 ″– 16″	ASSE 1013, AWWA C511, CSA B64.4, CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backsiphonage or backpressure Fire sprinkler systems)	ASSE 1047
		Sizes 1/4″–2″	
Backflow preventer plumbing devices:			
water closet flush tanks			
Backflow preventer for carbonated beverage machines	Low hazard	Backpressure or backsiphonage Sizes 1/4 ″– 3/8″	ASSE 1022

Table 2. 2021 IPC Changes Cost Impact

CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Backflow preventer with intermediate atmospheric vents — Low hazard — Backpressure or backsiphonage Sizes 1/4″– 3/4″ — ASSE 1012, CSA B64.3 Backflow preventer with intermediate atmospheric vent and pressure reducing valve — Low hazard — Backpressure or backsiphonage Sizes 1/4″– 3/4″ — ASSE 1081 Dual-check-valve-type backflow preventer — Low hazard — Backpressure or backsiphonage Sizes 1/4″–1″ — ASSE 1024, CSA B64.6 Hose connection backflow preventer — High or low hazard — Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes 1/2″–1″ — ASME A112.21.3, ASSE 1052, CSA B64.2.1.1 Hose connection vacuum breaker — High or low hazard — Low head backpressure or backsiphonage Sizes 1/2″, 3/4″, 1″ — ASME A112.21.3, ASSE 1011, CSA B64.2, CSA B64.2.1 Laboratory faucet backflow preventer — High or low hazard — Low head backpressure and backsiphonage — ASSE 1035, CSA B64.7 Pipe-applied atmospheric-type vacuum breaker — High or low hazard — Backsiphonage only Sizes 1/4″–4″ — ASSE 1001, CSA B64.1.1 Vacuum breaker wall hydrants, frost-resistant, automatic- draining-type — High or low hazard — Low head backpressure or backsiphonage Sizes 3/4″, 1″ — ASME A112.21.3, ASSE 1019, CSA B64.2.2 Other means or methods: Air gap — High or low hazard — Back siphonage or backpressure — ASME A112.1.2 Air gap fittings for use with plumbing fixtures, appliances and appurtenances — High or low hazard — Back siphonage or backpressure — ASME A112.1.3 Barometric loop — High or low hazard — Back siphonage only — (See Section 608.14.4)					
P97-18 Part II	Change existing definition for P2902.3.3 Backflow preventer with intermediate atmospheric vent, P2902.5.1 Connections to boilers, and TABLE P2902.3 APPLICATION OF BACKFLOW PREVENTERS to: **P2902.3.3 Backflow preventer with intermediate atmospheric vent.** Backflow preventers with intermediate atmospheric vents shall conform to ASSE 1012, ASSE 1081, or CSA B64.3. These devices shall be permitted to be installed where subject to continuous pressure conditions. These devices shall be prohibited as a means of protection where any hazardous chemical additives are introduced downstream of the device. The relief opening shall discharge by air gap and shall be prevented from being submerged.		X			ASSE 1081 covers devices that have combined products compliant to both ASSE 1003 and ASSE 1012. These devices have different hydrodynamic

Table 2. 2021 IPC Changes Cost Impact

CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	P2902.5.1 Connections to boilers. Where chemicals will not be introduced into a boiler, the potable water supply to the boiler shall be protected from the boiler by a backflow preventer with an intermediate atmospheric vent complying with ASSE 1012, ASSE 1081, or CSA B64.3. Where chemicals will be introduced into a boiler, the potable water supply to the boiler shall be protected from the boiler by an air gap or a reduced pressure principle backflow prevention assembly complying with ASSE 1013, CSA B64.4 or AWWA C511.					needs, hence the new standard for the device.

TABLE P2902.3
APPLICATION OF BACKFLOW PREVENTERS

DEVICE	DEGREE OF HAZARD[a]	APPLICATION[b]	APPLICABLE STANDARDS
Backflow Prevention Assemblies			
Double-check backflow prevention assembly and double-check fire protection backflow prevention assembly	Low hazard	Backpressure or back siphonage Sizes 3/8" – 16"	ASSE 1015, AWWA C510, CSA B64.5, CSA B64.5.1
Double-check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes 2" – 16"	ASSE 1048
Pressure vacuum breaker assembly	High or low hazard	Backsiphonage only Sizes 1/2" – 2"	ASSE 1020, CSA B64.1.2
Reduced pressure principle backflow prevention assembly and reduced pressure principle fire protection backflow prevention assembly	High or low hazard	Backpressure or backsiphonage Sizes 3/8" – 16"	ASSE 1013, AWWA C511, CSA B64.4, CSA B64.4.1
Reduced pressure detector fire protection back flow prevention assemblies	High or low hazard	Backsiphonage or backpressure (Fire sprinkler systems)	ASSE 1047
Spill-resistant vacuum breaker	High or low	Back siphonage only	ASSE 1056, CSA B64.1.3
Backflow Preventer Plumbing Devices			
Antisiphon-type fill valves for gravity water closet	High hazard	Back siphonage only	ASSE 1002/ASME A112.1002/CSA
Backflow preventer with intermediate atmospheric vents	Low hazard	Backpressure or back siphonage Sizes 1/4" – 3/8"	ASSE 1012, CSA B64.3
Backflow preventer with intermediate atmospheric vents and pressure reducing valve	Low hazard	Backpressure or backsiphonage Sizes 1/4" – 3/4"	ASSE 1081
Dual-check-valve-type backflow preventers	Low hazard	Backpressure or backsiphonage Sizes 1/4" – 1"	ASSE 1024, CSA B64.6

Table 2. 2021 IPC Changes Cost Impact

CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Hose-connection backflow preventer | High or low hazard | Low head backpressure, rated working pressure backpressure or | ASSE 1052, CSA B64.2.1.1 Hose-connection vacuum breaker | High or low hazard | Low head backpressure or backsi phonage Sizes 1/2", 3/4", 1" | ASSE 1011, CSA B64.2, CSA B64.2.1 Laboratory faucet backflow preventer | High or low hazard | Low head backpressure and back siphonage | ASSE 1035, CSA B64.7 Pipe-applied atmospheric-type vacuum breaker | High or low hazard | Backsiphonage only Sizes 1/4" – 4" | ASSE 1001, CSA B64.1.1 Vacuum breaker wall hydrants, frost-resistant, automatic- draining type | High or low hazard | Low head backpressure or backsi- phonage Sizes 3/4" | ASSE 1019, CSA B64.2.2 Other Means Or Methods | | | | Air gap | High or | Backsiphonage only | ASME A112.1.2 Air gap fittings for use with plumbing fixtures, appliances and | High or low hazard | Backsiphonage or backpressure | ASME A112.1.3					
P98-18 Part I	Change existing definition for 608.15.2.1 Relief port piping to: **608.15.2.1 Relief port piping.** The termination of the piping from the relief port or air gap fitting of a backflow preventer shall discharge to an approved indirect waste receptor or to the outdoors where it will not cause damage or create a nuisance. <u>The indirect waste receptor and drainage piping shall be sized to drain the maximum discharge flow rate from the relief port as published by the backflow preventer manufacturer.</u>		X			Clarification
P98-18 Part II	Change existing definition for P2902.6.3 Relief port piping to: **P2902.6.3 Relief port piping.** The termination of the piping from the relief port or air gap fitting of the backflow preventer shall discharge to an approved indirect waste receptor or to the outdoors where it will not cause damage or create a nuisance. <u>The indirect waste receptor and drainage piping shall be sized to drain the maximum discharge flow rate from the relief port as published by the backflow preventer manufacturer.</u>		X			Clarification
P100-18	Change existing definition for 609.2 Water Service for Group I-2: **609.2 Water service <u>for Group I-2, Condition 2</u>.** ~~Hospitals~~ <u>Group I-2, Condition 2 facilities</u> shall have <u>a minimum of</u> two water service pipes ~~installed in such a manner so as to minimize the potential for an interruption of the supply of water in the event of a water main or water service pipe failure~~ <u>sized such that with the loss of the largest service pipe, the remaining service pipes will meet the water demand for the entire facility. Each water service shall have a shut off valve in the building and a shut off valve at the utility-provided point of connection to the water main or other source of potable water</u>.		X			Clarification

Table 2. 2021 IPC Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IPC CHANGE SUMMARY</th><th colspan="3">IPC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td>P101-18</td><td>Change existing definition for 609.2.1 Tracer to:
609.2.1 Tracer. ~~A yellow~~ An insulated ~~copper~~ tracer wire listed ~~or a product designed for that~~ the purpose or other approved conductor shall be installed adjacent to underground nonmetalic piping serving as a water service for a hospital. Access shall be provided to the tracer wire or the tracer wire shall terminate above ground at each end of the nonmetalic piping. The tracer wire size shall be not less than 18 AWG and the wire insulation type shall be suitable for direct burial.</td><td></td><td></td><td>X</td><td>Minimal</td><td>Clarification</td></tr>
<tr><td>P103-18 Part I</td><td>Change existing definition for TABLE 702.3 BUILDING SEWER PIPE to:
TABLE 702.3
BUILDING SEWER PIPE
<table>
<tr><th>MATERIAL</th><th>STANDARD</th></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall</td><td>ASTM D2661; ASTM D2680; ASTM F628; ASTM F1488; CSA B181.1</td></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters, including SDR 42 (PS 20), PS 35, SDR 35 (PS 45), PS 50, PS 100, PS 140, SDR 23.5 (PS 150) and PS 200; with a solid, cellular core or composite wall</td><td>ASTM F1488; ASTM D2751</td></tr>
<tr><td>Cast-iron pipe</td><td>ASTM A74; ASTM A888; CISPI 301</td></tr>
<tr><td>Concrete pipe</td><td>ASTM C14; ASTM C76; CSA A257.1M; CSA A257.2M</td></tr>
<tr><td>Copper or copper-alloy tubing (Type K or L)</td><td>ASTM B75; ASTM B88; ASTM B251</td></tr>
<tr><td>Polyethylene (PE) plastic pipe (SDR-PR)</td><td>ASTM F714</td></tr>
<tr><td>Polypropylene (PP) plastic pipe</td><td>ASTM F2736; ASTM F2764; CSA B182.13</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall</td><td>ASTM D2665; ASTM F891; ASTM F1488</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters, including PS 25, SDR 41 (PS 28), PS 35, SDR 35 (PS 46), PS 50, PS 100, SDR 26 (PS 115), PS 140 and PS 200; with a solid, cellular core or composite wall</td><td>ASTM F891; ASTM F1488; ASTM D3034; CSA B182.2; CSA B182.4</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall</td><td>ASTM D2949 , ASTM F1488</td></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>Increases flexibility in piping choices for building sewers.</td></tr>
</table>

Table 2. 2021 IPC Changes Cost Impact

<table>
<tr><th>CODE CHANGE #</th><th>2021 IPC CHANGE SUMMARY</th><th colspan="3">IPC COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th></th><th></th><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td></td><td>
<table>
<tr><td>Polyvinylidene fluoride (PVDF) plastic pipe</td><td>ASTM F1673; CSA</td></tr>
<tr><td>Stainless steel drainage systems, Types 304 and 316L</td><td>ASME A112.3.1</td></tr>
<tr><td>Vitrified clay pipe</td><td>ASTM C4; ASTM C700</td></tr>
</table>
</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>P103-18 Part II</td><td>Change existing definition for TABLE P3002.2 BUILDING SEWER PIPE to:
TABLE P3002.2
BUILDING SEWER PIPE
<table>
<tr><th>MATERIAL</th><th>STANDARD</th></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall</td><td>ASTM D2661; ASTM D2680; ASTM F628; ASTM F1488</td></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters, including SDR 42 (PS 20), PS35, SDR 35 (PS 45), PS50, PS100, PS140, SDR 23.5 (PS 150) and PS200; with a solid, cellular core or composite wall</td><td>ASTM D2751; ASTM F1488</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters, including PS 25, SDR 41 (PS 28), PS 35, SDR 35 (PS 46), PS 50, PS 100, SDR 26 (PS 115), PS140 and PS 200; with a solid, cellular core or composite wall</td><td>ASTM D3034; ASTM F891; ASTM F1488; CSA B182.2; CSA B182.4</td></tr>
<tr><td>Cast-iron pipe</td><td>ASTM A74; ASTM A888; CISPI 301</td></tr>
<tr><td>Concrete pipe</td><td>ASTM C14; ASTM C76; CSA A257.1; CSA A257.2</td></tr>
<tr><td>Copper or copper-alloy tubing (Type K or L)</td><td>ASTM B75/B75M; ASTM B88; ASTM B251</td></tr>
<tr><td>Polyethylene (PE) plastic pipe (SDR-PR)</td><td>ASTM F714</td></tr>
<tr><td>Polyolefin pipe</td><td>ASTM F1412; CSA B181.3</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with solid, cellular core or composite wall</td><td>ASTM D2665; ASTM D2949; ASTM D3034; ASTM F1412; CSA B182.2; CSA B182.4</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe with a 3.25 inch O.D. and a solid, cellular core or composite</td><td>ASTM D2949; ASTM F1488</td></tr>
<tr><td>Stainless steel drainage systems, Types 304 and</td><td>ASME A112.3.1</td></tr>
<tr><td>Vitrified clay pipe</td><td>ASTM C425; ASTM C700</td></tr>
</table>
</td><td></td><td>X</td><td></td><td></td><td>Increases flexibility in piping choices for building sewers.</td></tr>
<tr><td>P105-18</td><td>Add new definition for 705.2.4 Push-fit joints as follows:</td><td></td><td>X</td><td></td><td></td><td>Necessary addition for clarification</td></tr>
</table>

Table 2. 2021 IPC Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IPC CHANGE SUMMARY</th><th colspan="3">IPC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td></td><td>705.2.4 Push-fit joints. Push-fit joints <u>DWV fittings shall be listed and labeled</u> <s>shall conform</s> to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>P106-18 Part II</td><td>Add new definition for P3003.3.4 Push-fit joints as follows:
P3003.3.4 Push-fit fitting joints. Push-fit <u>DWV</u> fittings joints shall <s>conform</s> <u>be listed and labeled</u> to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions.</td><td></td><td>X</td><td></td><td></td><td>Necessary addition for clarification</td></tr>
<tr><td>P108-18</td><td>Add new definition for 705.10.4 Push-fit joints and 705.10.4 Push-fit joints as follows:
<u>705.10.4 Push-fit joints.</u> <u>Push-fit joints shall conform to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions.</u>
<u>705.10.4 Push-fit joints.</u> <u>Push-fit joints shall conform to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions.</u>
Change existing definition for TABLE 702.4 PIPE FITTINGS to:
TABLE 702.4
PIPE FITTINGS
<table>
<tr><th>MATERIAL</th><th>STANDARD</th></tr>
<tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters</td><td>ASTM D2661; ASTM F628; CSA B181.1</td></tr>
<tr><td>Acrylonotrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters</td><td>ASTM D2751</td></tr>
<tr><td>Cast iron</td><td>ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301</td></tr>
<tr><td>Copper or copper alloy</td><td>ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29</td></tr>
<tr><td>Glass</td><td>ASTM C1053</td></tr>
<tr><td>Gray iron and ductile iron</td><td>AWWA C110/A21.10</td></tr>
<tr><td>Polyethylene</td><td>ASTM D2683</td></tr>
<tr><td>Polyolefin</td><td>ASTM F1412; CSA B181.3</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic in IPS diameters</td><td>ASTM D2665; ASTM F1866<u>; ASME A112.4.4</u></td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters</td><td>ASTM D3034</td></tr>
<tr><td>Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D.</td><td>ASTM D2949</td></tr>
<tr><td>Polyvinylidene fluoride (PVDF) plastic pipe</td><td>ASTM F1673; CSA B181.3</td></tr>
<tr><td>Stainless steel drainage systems, Types 304 and 316L</td><td>ASME A112.3.1</td></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>Adds push-fit DWV fittings as an option to the IPC</td></tr>
</table>

Table 2. 2021 IPC Changes Cost Impact

CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	<table><tr><td>Steel</td><td>ASME B16.9; ASME B16.11; ASME</td></tr><tr><td>Vitrified clay</td><td>ASTM C700</td></tr></table> For SI: 1 inch = 25.4 mm. **TABLE 702.4** **PIPE FITTINGS** <table><tr><th>MATERIAL</th><th>STANDARD</th></tr><tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters</td><td>ASTM D2661; ASTM F628; CSA B181.1</td></tr><tr><td>Acrylonotrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters</td><td>ASTM D2751</td></tr><tr><td>Cast iron</td><td>ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301</td></tr><tr><td>Copper or copper alloy</td><td>ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29</td></tr><tr><td>Glass</td><td>ASTM C1053</td></tr><tr><td>Gray iron and ductile iron</td><td>AWWA C110/A21.10</td></tr><tr><td>Polyethylene</td><td>ASTM D2683</td></tr><tr><td>Polyolefin</td><td>ASTM F1412; CSA B181.3</td></tr><tr><td>Polyvinyl chloride (PVC) plastic in IPS diameters</td><td>ASTM D2665; ASTM F1866; ASME A112.4.4</td></tr><tr><td>Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters</td><td>ASTM D3034</td></tr><tr><td>Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D.</td><td>ASTM D2949</td></tr><tr><td>Polyvinylidene fluoride (PVDF) plastic pipe</td><td>ASTM F1673; CSA B181.3</td></tr><tr><td>Stainless steel drainage systems, Types 304 and 316L</td><td>ASME A112.3.1</td></tr><tr><td>Steel</td><td>ASME B16.9; ASME B16.11; ASME</td></tr><tr><td>Vitrified clay</td><td>ASTM C700</td></tr></table> For SI: 1 inch = 25.4 mm. Add new standard(s). A112.4.4-2017: Plastic Push Fit Drain, Waste, and Vent (DWV) Fittings					
P109-18 Part II	Add new definition for P3003.9.4 Push-fit joints. **P3003.9.4 Push-fit joints.** Push-fit joints shall conform to ASME A112.4.4 and shall be installed in accordance with the manufacturer's instructions. Change existing definition for: **TABLE 702.4** **PIPE FITTINGS** <table><tr><th>PIPE MATERIAL</th><th>FITTING STANDARD</th></tr></table>		X			Adds push-fit DWV fittings as an option to the IPC

Table 2. 2021 IPC Changes Cost Impact

CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	<table><tr><td>Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters</td><td>ASTM D2661; ASTM D3311; ASTM F628; CSA B181.1</td></tr><tr><td>Acrylonotrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters</td><td>ASTM D2751</td></tr><tr><td>Cast-iron</td><td>ASME B16.4; ASME B16.12; ASTM A74; ASTM A888; CISPI 301</td></tr><tr><td>Copper or copper alloy</td><td>ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29</td></tr><tr><td>Gray iron and ductile iron</td><td>AWWA C110/A21.10</td></tr><tr><td>Polyethylene</td><td>ASTM D2683</td></tr><tr><td>Polyolefin</td><td>ASTM F1412; CSA B181.3</td></tr><tr><td>Polyvinyl chloride (PVC) plastic in IPS diameters</td><td>ASTM D2665; ASTM D3311; ASTM F1866; ASME A112.4.4</td></tr><tr><td>Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters</td><td>ASTM D3034</td></tr><tr><td>Polyvinyl chloride (PVC) plastic pipe with a 3.25 inch O.D.</td><td>ASTM D2949</td></tr><tr><td>PVC fabricated fittings</td><td>ASTM F1866</td></tr><tr><td>Stainless steel drainage systems, Types 304 and 316L</td><td>ASME A112.3.1</td></tr><tr><td>Vitrified clay</td><td>ASTM C700</td></tr></table> For SI: 1 inch = 25.4 mm.					
P113-18 Part I	Add new definition for 708.1.6 Cleanout equivalent as follows: **708.1.6 Cleanout equivalent.** A fixture trap or a fixture with integral trap, removable without altering concealed piping, shall be acceptable as a cleanout equivalent. Change existing definition for 708.1 Cleanouts required to: **708.1 Cleanouts required.** Cleanouts shall be provided for drainage piping in accordance with Sections 708.1.1 through ~~708.1.11~~ 708.1.12.	X			Minimal	Clarification
P113-18 Part II	Add new definition for P3005.2.10.1 Cleanout equivalent as follows: **P3005.2.10.1 Cleanout Equivalent.** A fixture trap or a fixture with integral trap, removable without altering the concealed piping shall be acceptable as a cleanout equivalent. Change existing definition for P3005.2 Cleanouts required to: **P3005.2 Cleanouts required.** Cleanouts shall be provided for drainage piping in accordance with Sections P3005.2.1 through ~~P3005.2.11~~ P3005.2.12.	X			Minimal	Clarification

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
P115-18 Part I	Add new definition for SECTION 717 as follows: **SECTION 717** **RELINING BUILDING SEWERS AND BUILDING DRAINS** **717.1 General.** This section shall govern the relining of existing building sewers and building drainage piping. **717.2 Applicability.** The relining of existing building sewer and building drainage piping shall be limited to gravity drainage piping,4 inches (102 mm) in diameter and larger. The relined piping shall be of the same nominal size as existing piping. **717.3 Pre-installation requirements.** Prior to commencement of the relining installation, existing piping sections to be relined shall be descaled and cleaned. After the cleaning process has occurred and water has been flushed through the system, the piping shall be inspected internally by a recorded video camera survey. **717.3.1 Pre-installation recorded video camera survey.** The video survey shall include verification of the project address location. The video shall include notations of the cleanout and fitting locations, and the approximate depth of existing piping. The video shall also include notations of the length of piping at intervals no greater than 25 feet. **717.4 Permitting.** Prior to permit issuance, the code official shall review and evaluate the pre-installation recorded video camera survey to determine if the piping system is capable to be relined in accordance with the proposed lining system manufacturer's installation requirements and applicable referenced standards. **717.5 Prohibited applications.** Where review of the pre-installation recorded video camera survey reveals that piping systems are not installed correctly or defects exist, relining shall not be permitted. The defective portions of piping shall be exposed and repaired with pipe and fittings in accordance with this code. Defects shall include, but are not limited to, backgrade or insufficient slope, complete pipe wall deterioration or complete separations such as from tree root invasion or improper support. **717.6 Relining materials.** The relining materials shall be manufactured in compliance with applicable standards and certified as required in Section 303. Fold -and-form pipe reline materials shall be manufactured in compliance with ASTM F1504 or ASTMF1871. **717.7 Installation.** The installation of relining materials shall be performed in accordance with the manufacturer's installation instructions, applicable referenced standards and this code.	X			Minimal	Necessary addition for clarification.

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	717.7.1 Material data report. The installer shall record the data as required by the relining material manufacture and applicable standards. The recorded data shall include but is not limited to the location of the project, relining material type, amount of product installed and conditions of the installation. A copy of the data report shall be provided to the code official prior to final approval. **717.8 Post-installation recorded video camera survey.** The completed relined piping system shall be inspected internally by a recorded video camera survey after the system has been flushed and flow tested with water. The video survey shall be submitted to the the code official prior to finalization of the permit. The video survey shall be reviewed and evaluated to provide verification that no defects exist. Any defects identified shall be repaired and replaced in accordance with this code. **717.9 Certification.** A certification shall be provided in writing to the code official, from the permit holder, that the relining materials have been installed in accordance with the manufacturer's installation instructions, the applicable standards and this code. **717.10 Approval.** Upon verification of compliance with the requirements of Sections 717.1 through 717.9, the code official shall approve the installation.					
P115-18 Part II	Change existing definition for SECTION P3011 to: ~~**SECTION** **P3011**~~ ~~**REPLACEMENT**~~ **RELINING OF** ~~**UNDERGROUND**~~ **BUILDING SEWERS** ~~**BYPVC FOLD**~~ **AND** ~~**FORM METHODS**~~ **BUILDING DRAINS** **P3011.1 General.** This section shall govern the ~~replacement~~ relining of existing building sewer ~~piping by PVC Fold and Form methods.~~ and building drainage piping. **P3011.2 Applicability.** The ~~replacement~~ relining of existing building sewer ~~piping by PVC fold and form methods~~ and building drainage piping shall be limited to gravity drainage piping 4 inches (102 mm) ~~to 18 inches (457 mm). The replacement~~ in diameter and larger. The relined piping shall be of the same nominal size as existing piping. **P3011.3 ~~Preinstallation inspection~~ Pre-installation Requirements.** ~~The~~ Prior to commencement of the relining installation, existing piping sections to be ~~replaced~~ relined shall be descaled and cleaned. After the cleaning process has occurred and water has been flushed through the system, the piping shall be inspected internally by a recorded video camera survey. ~~The survey shall include notations of the~~	X			Minimal	Provides installation and acceptance criteria when the application is encountered.

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~position of cleanouts and the depth of connections to existing piping.~~ Add new definition for P3011 as follows: **P3011.3.1 Pre-installation recorded video camera survey.** The video survey shall include verification of the project address location. The video shall include notations of the cleanout and fitting locations, and the approximate depth of existing piping. The video shall also include notations of the length of piping at intervals no greater than 25 feet. **P3011.4 Permitting.** Prior to issuing a permit for relining, the building official shall review and evaluate the pre-installation recorded video camera survey to determine whether the piping system is capable to be relined in accordance with the proposed lining system manufacturer's installation requirements and applicable referenced standards. **P3011.5 Prohibited applications.** Where review of the pre-installation recorded video camera survey reveals that piping systems are not installed correctly, or defects exist, relining shall not be permitted. The defective portions of piping shall be exposed and repaired with pipe and fittings in accordance with this code. Defects shall include, but are not limited to, backslope or insufficient slope, complete pipe wall deterioration or complete separations such as from tree root invasion or improper support. **P3011.6 Relining materials.** The relining materials shall be manufactured in compliance with applicable standards and certified as required in Section P2609. Fold-and-form pipe reline materials shall be manufactured in compliance with ASTM F1504 or ASTM F1871. **P3011.7 Installation.** The installation of relining materials shall be performed in accordance with the manufacturer's installation instructions, applicable referenced standards and this code. **P3011.7.1 Material data report.** The installer shall record the data as required by the relining material manufacture and applicable standards. The recorded data shall include but is not limited to the location of the project, relining material type, amount of product installed and conditions of the installation. A copy of the data report shall be provided to the building official prior to final approval. **P3011.8 Post-installation recorded video camera survey.** The completed relined piping system shall be inspected internally by a recorded video camera survey after the system has been flushed and flow tested with water. The video survey shall be submitted to the the code official prior to finalization of the					

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	permit. The video survey shall be reviewed and evaluated to provide verification that no defects exist. Any defects identified shall be repaired and replaced in accordance with this code. **P3011.9 Certification.** A certification shall be provided in writing to the building official, from the permit holder, that the relining materials have been installed in accordance with the manufacturer's installation instructions, the applicable standards and this code. **P3011.10 Approval.** Upon verification of compliance with the requirements of Sections P3011.1 through P3011.9, the building official shall approve the installation. Delete existing definition for Pipe, Installation, Cleanouts, Post Installation inspection, and Pressure testing.					
P116-18	Add new definition for SECTION 717 as follows: **SECTION 717** **BUILDING SEWER AND SEWER SERVICE LATERAL REHABILITATION** **717.1 Building sewer and sewer service lateral rehabilitation.** ~~Any~~ Cured-in-place rehabilitation of building sewer piping and sewer service lateral piping shall be in accordance with ASTM F2599. ~~Any~~ Cured-in-place rehabilitation of building sewer and sewer service lateral pipe and its connection to the main sewer pipe shall be in accordance with F2561. All cured-in-place rehabilitation of building sewer piping and sewer service laterals shall include the use of hydrophilic rings or gaskets meeting ASTM F3240 to assure water tightness and elimination of ground water penetration.		X			Necessary addition for clarification
P117-18	Change existing definition for 903.1 Roof extension to: ~~**903.1 Roof extension**~~ **Vent terminal required.** ~~Open vent pipes that extend through a roof shall be terminated not less than [NUMBER] inches (mm) above the roof. Where a roof is to be used for assembly or as a promenade, observation deck, sunbathing deck or similar purposes, open vent pipes shall terminate not less than 7 feet (2134 mm) above the roof.~~ The vent pipe shall terminate by extending to the outdoors through the roof or the side wall in accordance with one of the methods identified in Section 903.1.1 through 903.1.4. Add new definition for 903.1.1 Roof extension unprotected, 903.1.2 Roof used for recreational or assembly purposes, 903.1.3 Protected vent terminal, and 903.1.4 Sidewall vent terminal as follows: **903.1.1 Roof extension unprotected.** Open vent pipes that extend through a roof shall be terminated not less than [NUMBER] inches (mm) above the roof.	X			Minimal	Provides options for vent termination

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	903.1.2 Roof used for recreational or assembly purposes. Where a roof is to be used as a promenade, restaurant, bar, observation deck, sunbathing deck, or similar purposes, open vent pipes shall terminate not less than 7 feet (2134 mm) above the roof. **903.1.3 Protected vent terminal.** Where an open vent pipe terminates above a sloped roof and is covered by either a roof-mounted panel (such as a solar collector or photovoltaic panel mounted over the vent opening) or a roof element (such as an architectural feature or a decorative shroud), the vent pipe shall terminate not less than 2 inches (51 mm) above the roof surface. Such roof elements shall be designed to prevent the adverse effects of snow accumulation and wind on the function of the vent. The placement of a panel over a vent pipe and the design of a roof element covering the vent pipe shall provide for an open area for the vent pipe to the outdoors that is not less than the area of the pipe, as calculated from the inside diameter of the pipe. Such vent terminals shall be protected by a method that prevents birds and rodents from entering or blocking the vent pipe opening. **903.1.4 Sidewall vent terminal.** Vent terminals extending through the wall shall terminate not less than 10 feet (3048 mm) from the lot line and 10 feet (3048 mm) above the highest adjacent grade within 10 feet (3048 mm) horizontally of the vent terminal. Vent terminals shall not terminate under the overhang of a structure with soffit vents. Side wall vent terminals shall be protected to prevent birds or rodents from entering or blocking the vent opening. Delete existing definition for 903.6 Extension through the wall.					
P118-18	Change existing definition for 915.1 Type of fixtures to: **915.1 Type of fixtures.** A combination waste and vent system shall not serve fixtures other than floor drains, sinks, lavatories and drinking fountains. Combination waste and vent systems shall not receive the discharge from a ~~food waste disposer or~~ clinical sink.	X			Minimal	Clarification
P120-18	Change existing definition for Fixture traps to: **Fixture traps.** Each plumbing fixture shall be separately trapped by a liquid-seal trap, except as otherwise permitted by this code. The vertical distance from the fixture outlet to the trap weir shall not exceed 24 inches (610 mm), and the horizontal distance shall not exceed 30 inches (610 mm) measured from the centerline of the fixture outlet to the centerline of the inlet of the trap. The height of a clothes washer standpipe above a trap shall conform to Section 802.3.3. A fixture shall not be double trapped. **Exceptions:**		X			Clarification

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CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	1. This section shall not apply to fixtures with integral traps. 2. A combination plumbing fixture is permitted to be installed on one trap, provided that one compartment is not more than 6 inches (152 mm) deeper than the other compartment and the waste outlets are not more than 30 inches (762 mm) apart. 3. Floor drains in multilevel parking structures that discharge to a building storm sewer shall not be required to be individually trapped. Where floor drains in multilevel parking structures are required to discharge to a combined building sewer system, the floor drains shall not be required to be individually trapped provided that they are connected to a main trap in accordance with Section 1103.1. 4. Where a hydromechanical grease interceptor serves a food utensil, dishes, pots and pans sink, in accordance with the manufacturer's installation instructions. The branch drain serving the interceptor shall be provided with an emergency floor drain down stream of the interceptor connection, and the branch shall serve only the emergency floor drain and the interceptor. Where the interceptor serves combination sink of not more than three compartments where the vertical distance from the fixture outlet to the inlet of the interceptor does not exceed 30 inches (762 mm) and the developed length of the waste pipe from the most upstream fixture outlet to the inlet of the interceptor does not exceed 60 inches (1524 mm). The food utensil, dishes, pots and pans sink shall be required to connect directly with the interceptor.					
P122-18	Add new definition for 1002.4.1.5 Fixture drain connection for trap priming as follows: **1002.4.1.5 Fixture drain connection for trap priming.** A fixture drain from a lavatory or hand sink shall serve as a method of providing trap seal protection for an emergency floor drain, a trench drain, or a floor sink where such fixtures are located in the same room. A fixture drain from a drinking fountain shall serve as a method of providing trap seal protection for an emergency floor drain, a trench drain, or a floor sink where such fixtures are in the same room or in a room adjacent to the room	X			Minimal	Method for providing trap seal protection that can lower the owner's Overall maintenance

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		Decrease	None	Increase		
Sub Code:						
	having the drinking fountain. The fixture drain shall not be routed on or above the surface of the floor and shall connect to the floor drain, trench drain, or floor sink at a point that is below the flood level rim and above the inlet to the trap of the receiving fixture. Change existing definition for Trap seal protection to: **Trap seal protection.** Trap seals of emergency floor drain traps and trap seals subject to evaporation shall be protected by one of the methods in Sections 1002.4.1.1 through ~~1002.4.1.4~~1002.4.1.5.					cost and requires no special or certified product
P126-18	Change existing definition for 1102.6 Roof Drains to: **1102.6 Roof Drains.** Roof drains shall conform to ASME A112.6.4 or ASME A112.3.1. Roof drains, other than siphonic roof drains, shall be tested and rated in accordance with ASME A112.6.4 or ASPE/IAPMO Z1034.			X	Minimal	Answers questions about roof drains and storm drain system piping requirements
P129-18	Change existing definition for 1106.2 Size of storm drain piping: **1106.2 Size of storm drain piping.** Vertical and horizontal storm drain piping shall be sized based on the flow rate through the roof drain. The flow rate, as calculated in accordance with Section 1106.2.1, shall be checked against the roof drain manufacturer's published flow rate for the specific roof drain model and size to verify that the selected roof drain will handle the anticipated flow. The flow rate in storm drain piping shall not exceed that specified in Table 1106.2. Add new definition for 1106.2.1 Rainfall rate conversion method as follows: **1106.2.1 Rainfall rate conversion method.** The rainfall rate falling on a roof surface shall be converted to a gallons per minute flow rate in accordance with Equation 11-1. GPM = R • A • 0.0104 **(Equation 11-1)** where, R = Rainfall intensity in inches per hour A = Roof area in square feet		X			Assists design professionals and code enforcement in making sure that the storm drain piping is properly sized.
P131-18 Part I	Change existing definition for Scope to: ~~**Scope**~~ **General.** The provisions of Chapter 13 shall govern the materials, design, construction and installation of systems for the collection, storage, treatment and distribution of nonpotable water. For nonpotable rainwater systems, the provisions of CSA B805/ICC 805 shall be an alternative for regulating the materials,		X			Provides for an option to the user.

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	design, construction and installation of systems for rainwater collection, storage, treatment and distribution of nonpotable water. The use and application of nonpotable water shall comply with laws, rules and ordinances applicable in the jurisdiction.					
P131-18 Part II	Change existing definition for P2912.1 General to: **P2912.1 General.** The provisions of this section shall govern the construction, installation, alteration, and repair of rainwater collection and conveyance systems for the collection, storage, treatment and distribution of rainwater for nonpotable applications, ~~as permitted by~~ .For nonpotable rainwater systems, the provisions of CSA B805/ICC 805 shall be an alternative for regulating the materials, design, construction and installation of systems for rainwater collection, storage, treatment and distribution of nonpotable water.The use and application of nonpotable water shall comply with laws, rules and ordinances applicable in the jurisdiction.		X			Provides for an option to the user.
P133-18 Part I	Change existing definition for SECTION 14 to: **SECTION 14** **SUBSURFACE ~~LANDSCAPE IRRIGATION~~ GRAY WATER SOIL ABSORPTION SYSTEMS** **Scope.** The provisions of this chapter shall govern the materials, design, construction and installation of subsurface ~~landscape irrigation~~ graywater soil absorption systems connected to nonpotable water from on-site water reuse systems. **Materials.** Above-ground drain, waste and vent piping for subsurface ~~landscape irrigation~~ graywater soil absorption systems shall conform to one of the standards listed in Table 702.1. Subsurface ~~landscape irrigation~~ graywater soil absorption systems, underground building drainage and vent pipe shall conform to one of the standards listed in Table 702.2. **Tests.** Drain, waste and vent piping for subsurface ~~landscape irrigation~~ graywater soil absorption systems shall be tested in accordance with Section 312. **Inspections.** Subsurface ~~landscape irrigation~~ graywater soil absorption systems shall be inspected in accordance with Section 107. **Disinfection.** Disinfection shall not be required for on-site nonpotable water reuse for subsurface ~~landscape irrigation~~ graywater soil absorption systems. **Coloring.** On-site nonpotable water reuse for subsurface ~~landscape irrigation~~ graywater soil absorption systems shall not be required to be dyed. **1402.1 Sizing.** The system shall be sized in accordance with the sum of the output of all water sources connected to the		X			Clarification

<table>
<tr><th colspan="7">Table 2. 2021 IPC Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IPC CHANGE SUMMARY</th><th colspan="3">IPC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>subsurface ~~irrigation~~ gray water soil absorption system. Where gray water collection piping is connected to subsurface landscape irrigation systems, gray water output shall be calculated according to the gallons-per-day-per-occupant number based on the type of fixtures connected. The gray water discharge shall be calculated by the following equation:
1402.3 Subsurface ~~landscape irrigation~~ graywater soil absorption site location. The surface grade of all soil absorption systems shall be located at a point lower than the surface grade of any water well or reservoir on the same or adjoining lot. Where this is not possible, the site shall be located so surface water drainage from the site is not directed toward a well or reservoir. The soil absorption system shall be located with a minimum horizontal distance between various elements as indicated in Table 1402.3. Private sewage disposal systems in compacted areas, such as parking lots and driveways, are prohibited. Surface water shall be diverted away from any soil absorption site on the same or neighboring lots.
TABLE 1402.3
LOCATION OF SUBSURFACE ~~IRRIGATION~~ GRAYWATER SOIL ABSORPTION SYSTEM
<table><tr><th>ELEMENT</th><th colspan="2">MINIMUM HORIZONTAL DISTANCE</th></tr><tr><td></td><td>Storage tank (feet)</td><td>Absorption field (feet)</td></tr><tr><td>Buildings</td><td>5</td><td>2</td></tr><tr><td>Lot line adjoining private property</td><td>5</td><td>5</td></tr><tr><td>Water wells</td><td>50</td><td>100</td></tr><tr><td>Streams and lakes</td><td>50</td><td>50</td></tr><tr><td>Seepage pits</td><td>5</td><td>5</td></tr><tr><td>Septic tanks</td><td>0</td><td>5</td></tr><tr><td>Water service</td><td>5</td><td>5</td></tr><tr><td>Public water main</td><td>10</td><td>10</td></tr></table>For SI: 1 foot = 304.8 mm.

1403.1 Installation. Absorption systems shall be installed in accordance with Sections 1403.1.1 through 1403.1.5 ~~to provide landscape irrigation without surfacing of water.~~</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>P133-18 Part II</td><td>Change existing definition for SECTION P3009 to:
~~SECTION~~ P3009
SUBSURFACE ~~LANDSCAPE IRRIGATION~~ GRAY WATER SOIL ABSORPTION SYSTEMS
P3009.1 Scope. The provisions of this section shall govern the materials, design, construction and installation of subsurface</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~landscape irrigation~~ gray water soil absorption systems connected to nonpotable water from on-site water reuse systems. **P3009.2 Materials.** Above-ground drain, waste and vent piping for subsurface ~~landscape irrigation~~ gray water soil absorption systems shall conform to one of the standards indicated in Table P3002.1(1). Subsurface ~~landscape irrigation~~ gray water soil absorption, underground building drainage and vent pipe shall conform to one of the standards indicated in Table P3002.1(2). **P3009.3 Tests.** Drain, waste and vent piping for subsurface ~~landscape irrigation~~ gray water soil absorption systems shall be tested in accordance with Section P2503. **P3009.4 Inspections.** Subsurface ~~landscape irrigation~~ gray water soil absorption systems shall be inspected in accordance with Section R109. **P3009.5 Disinfection.** Disinfection shall not be required for on-site nonpotable reuse water for subsurface ~~landscape irrigation~~ gray water soil absorption systems. **P3009.6 Coloring.** On-site nonpotable reuse water used for subsurface ~~landscape irrigation~~ gray water soil absorption systems shall not be required to be dyed. **P3009.7 Sizing.** The system shall be sized in accordance with the sum of the output of all water sources connected to the subsurface ~~irrigation system.~~ gray water soil absorption system. Where gray-water collection piping is connected to subsurface ~~landscape~~ gray water soil absorption irrigation systems, gray-water output shall be calculated according to the gallons-per-day-per-occupant (liters per day per occupant) number based on the type of fixtures connected. The gray- water discharge shall be calculated by the following equation: **P3009.9 Subsurface ~~landscape irrigation~~ gray water soil absorption system site location.** The surface grade of soil absorption systems shall be located at a point lower than the surface grade of any water well or reservoir on the same or adjoining lot. Where this is not possible, the site shall be located so surface water drainage from the site is not directed toward a well or reservoir. The soil absorption system shall be located with a minimum horizontal distance between various elements as indicated in Table P3009.9. Private sewage disposal systems in compacted areas, such as parking lots and driveways, are prohibited. Surface water shall be diverted away from any soil absorption site on the same or neighboring lots. **TABLE P3009.9**						

Table 2. 2021 IPC Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IPC CHANGE SUMMARY</th><th colspan="3">IPC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td></td><td>LOCATION OF SUBSURFACE ~~IRRIGATION~~ GRAY WATER SOIL ABSORPTION SYSTEM
<table>
<tr><th>ELEMENT</th><th colspan="2">MINIMUM HORIZONTAL DISTANCE</th></tr>
<tr><th></th><th>STORAGE TANK (feet)</th><th>~~IRRIGATION DISPOSAL~~ ABSORPTION FIELD (feet)</th></tr>
<tr><td>Buildings</td><td>5</td><td>2</td></tr>
<tr><td>Lot line adjoining private property</td><td>5</td><td>5</td></tr>
<tr><td>Water wells</td><td>50</td><td>100</td></tr>
<tr><td>Streams and lakes</td><td>50</td><td>50</td></tr>
<tr><td>Seepage pits</td><td>5</td><td>5</td></tr>
<tr><td>Septic tanks</td><td>0</td><td>5</td></tr>
<tr><td>Water service</td><td>5</td><td>5</td></tr>
<tr><td>Public water main</td><td>10</td><td>10</td></tr>
</table>
For SI: 1 foot = 304.8 mm.
P3009.10 Installation. Absorption systems shall be installed in accordance with Sections P3009.10.1 through P3009.11 ~~to provide landscape irrigation without surfacing of water.~~</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>ADM6-19</td><td>[Reserved under FBC]
Change existing definition for [A] 101.2 Scope to:
[A] 101.2 Scope. The provisions of this code shall apply to the erection, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of plumbing systems within this jurisdiction. This code shall regulate nonflammable medical gas, inhalation anesthetic, vacuum piping, nonmedical oxygen systems and sanitary and condensate vacuum collection systems. The installation of fuel gas distribution piping and equipment, fuel-gas-fired water heaters and water heater venting systems shall be regulated by the International Fuel Gas Code. Provisions in the appendices shall not apply unless specifically adopted.
Exception:
Detached one- and two-family dwellings and ~~multiple single-family dwellings (~~ townhouses) not more than three stories ~~high~~ above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with this code or the International Residential Code.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>ADM9-19</td><td>[Reserved under FBC]
Change existing definition for [A] 101.3 Intent to:
~~101.3 Intent.~~ Purpose. The purpose of this code is to establish minimum ~~standards~~ requirements to provide a reasonable level of safety, health, property protection and ~~public~~ general welfare</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of plumbing equipment and systems.					
ADM16-19 Part I	**[Reserved under FBC]** Change existing definition for SECTION 103 to: **SECTION 103** **~~DEPARTMENT OF PLUMBING INSPECTION~~ CODE COMPLIANCE AGENCY** **~~103.1 General.~~ Creation of agency.** The ~~department of plumbing inspection~~ [INSERT NAME OF DEPARTMENT] is hereby created and the ~~executive~~ official in charge thereof shall be known as the code official. The function of the agency shall be the implementation, administration and enforcement of the provisions of this code. **103.2 Appointment.** The code official shall be appointed by the chief appointing authority of the jurisdiction. **103.3 Deputies.** In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the code official shall have the authority to appoint a deputy code official, other related technical officers, inspectors and other employees. Such employees shall have powers as delegated by the code official. **~~103.4~~ 104.8 Liability.** The code official, member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered civilly or criminally liable personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties. **~~103.4.1~~ 104.8.1 Legal defense.** Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.		X			Clarification
ADM27-19	**[Reserved under FBC]** Add new definition for SECTION 107 as follows: **SECTION 107** **FEES**		X			Helps correlate all the I-Codes together and

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CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	107.2 Schedule of permit fees. Where work requires a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority. **107.5 Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law. **107.6 Refunds.** The code official is authorized to establish a refund policy.					makes it easier to understand where the requirements are located.
ADM28-19	**[Reserved under FBC]** Change existing definitions for SECTION 107 to: **SECTION 107** **CONSTRUCTION DOCUMENTS** ~~**106.3.1**~~ **107.1 Construction documents.** Construction documents, engineering calculations, diagrams and other such data shall be submitted in two or more sets with each application for a permit. The code official shall require construction documents, computations and specifications to be prepared and designed by a registered design professional where required by state law. Construction documents shall be drawn to scale and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that the work conforms to the provisions of this code. Construction documents for buildings more than two stories in height shall indicate where penetrations will be made for pipes, fittings and components and shall indicate the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking. **Exception:** The code official shall have the authority to waive the submission of construction documents, calculations or other data if the nature of the work applied for is such that reviewing of construction documents is not necessary to determine compliance with this code. ~~**106.5.6**~~ **107.2 Retention of construction documents.** One set of *approved* construction documents shall be retained by the code official for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws. One set of *approved* construction documents shall be returned to the applicant, and said set shall be kept on the site of the building or work at all times during which the work authorized thereby is in progress.		X			Provides consistency.

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
ADM31-19 Part I	**[Reserved under FBC]** Change existing definitions for SECTION 108 to: ~~**107.5**~~ **108.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. ~~**107.5.1**~~ **108.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.		X			Provides consistency
ADM40-19 Part I	**[Reserved under FBC]** Change existing definitions for SECTION 113 to: **SECTION 109** **MEANS OF ~~APPEAL~~ APPEALS** ~~**109.1**~~**109.2 ~~Application for appeal.~~ Limitations on authority.** ~~Any person shall have the right to appeal a decision of the code official to the board of appeals.~~ An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply , or an ~~equally good~~ equivalent or better form of construction is proposed. The ~~application shall be filed on a form obtained from the code official within 20 days after the notice was served.~~ board shall not have authority to waive requirements of this code or interpret the administration of this code. **109.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction. **109.4 Administration.** The code official shall take immediate action in accordance with the decision of the board. **SECTION 110** **BOARD OF APPEALS** ~~**109.2**~~ **110.1 Membership of board.** The board of appeals shall consist of five members appointed by the chief appointing authority as follows: one for 5 years, one for 4 years, one for 3 years, one for 2 years and one for 1 year. Thereafter, each new member shall serve for 5 years or until a successor has been appointed.		X			Clarification
ADM41-19 Part I	**[Reserved under FBC]** Change existing definitions for SECTION 115 to: **SECTION 109** **STOP WORK ORDER**		X			Standardizes the language and requirements

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CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	109.1 Authority. Where the code official finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the code official is authorized to issue a stop work order. **109.2 Issuance.** The stop work order shall be in writing and shall be given to the owner of the property, the owner's authorized agent or the person performing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume. **109.3 Emergencies.** Where an emergency exists, the code official shall not be required to give a written notice prior to stopping the work. **109.4 Failure to comply.** Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fines established by the authority having jurisdiction.					for a stop work order throughout all the Codes
ADM43-19 Part I	**[Reserved under FBC]** Change existing definitions for APPENDIX B to: ~~**109.2**~~ **A101.3 Membership of board.** The board ~~of appeals~~ shall consist of five voting members appointed by the chief appointing authority ~~as follows: one for 5 years, one for 4 years, one for 3 years, one for 2 years and one for 1 year. Thereafter, each new~~ of the jurisdiction. Each member shall serve for ~~5~~ [INSERT NUMBER OF YEARS] years or until a successor has been appointed. The board member's terms shall be staggered at intervals, so as to provide continuity. The code official shall be an ex officio member of said board but shall not vote on any matter before the board. ~~**109.2.1**~~ **A101.3.1 Qualifications.** The board ~~of appeals~~ shall consist of five individuals, who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction. ~~one from each of the following professions or disciplines:~~ ~~1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with not less than 10 years' experience, 5 years of which shall have been in responsible charge of work.~~ ~~2. Registered design professional with structural engineering or architectural experience.~~ ~~3. Registered design professional with mechanical and plumbing engineering experience; or a mechanical and~~		X			Standardizes the language across the Codes and gives appropriate guidance to establish a board of appeals.

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CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~plumbing contractor with not less than 10 years' experience, 5 years of which shall have been in responsible charge of work.~~ ~~4. Registered design professional with electrical engineering experience; or an electrical contractor with not less than 10 years' experience, 5 years of which shall have been in responsible charge of work.~~ ~~5. Registered design professional with fire protection engineering experience; or a fire protection contractor with not less than 10 years' experience, 5 years of which shall have been in responsible charge of work.~~ ~~**109.2.2**~~ **A101.3.2 Alternate members.** The chief appointing authority ~~shall~~ is authorized to appoint two alternate members who shall be called by the board ~~chairman~~ chairperson to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership, and shall be appointed for ~~5 years~~ the same term or until a successor has been appointed. ~~**109.2.3**~~ **A101.3.4 ~~Chairman.~~ Chairperson.** The board shall annually select one of its members to serve as ~~chairman.~~ chairperson. ~~**109.2.5**~~ **A101.3.5 Secretary.** The chief ~~administrative officer~~ appointing authority shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings ~~in the office of the chief administrative officer.~~ which shall set forth the reasons for the board's decision, the vote of each member, the absence of a member and any failure of a member to vote. ~~**109.2.4**~~ **A101.3.6 ~~Disqualification~~ Conflict of ~~member.~~ interest.** A member ~~shall not hear an appeal in which that member has~~ with any personal, professional or financial ~~interest.~~ interest in a matter before the board shall declare such interest and refrain from participating in discussions, deliberations and voting on such matters. ~~**109.2.6**~~ **A101.3.7 Compensation of members.** Compensation of members shall be determined by law. ~~**109.4.1**~~ **A101.4 ~~Procedure.~~ Rules and procedures.** The board shall ~~adopt and make available to the public through the secretary procedures under which a hearing will be conducted.~~ establish policies and procedures necessary to carry out its duties consistent with the provisions of this code and applicable state law. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be ~~received.~~ presented.					

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		Decrease	None	Increase		
Sub Code:						
	~~**109.3**~~ **A101.5 Notice of meeting.** The board shall meet upon notice from the ~~chairman~~ chairperson, within 10 days of the filing of an appeal or at stated periodic ~~meetings.~~ intervals. ~~**109.4**~~ **A101.5.1 Open hearing.** ~~Hearings~~ All hearings before the board shall be open to the public. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard. ~~**109.5**~~ **A101.5.3 Postponed hearing.** When five members are not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing. ~~**109.6**~~ **A101.7 Board decision.** The board shall only modify or reverse the decision of the code official by a concurring vote of three or more members. ~~**109.6.1**~~ **A101.7.1 Resolution.** The decision of the board shall be by resolution. ~~Certified copies shall be~~ Every decision shall be promptly filed in writing in the office of the code official within three days and shall be open to the public for inspection. A certified copy shall be furnished to the appellant or the appellant's representative and to the code official. ~~**109.6.2**~~ **A101.7.2 Administration.** The code official shall take immediate action in accordance with the decision of the board. ~~**109.7**~~ **A101.8 Court review.** Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer. **APPENDIX A** **BOARD OF APPEALS** **SECTION A101** **GENERAL** **A101.1 Scope.** A board of appeals shall be established within the jurisdiction for the purpose of hearing applications for modification of the requirements of this code pursuant to the provisions of Section XXX (Means of Appeals). The board shall be established and operated in accordance with this section, and shall be authorized to hear evidence from appellants and the code official pertaining to the application and intent of this code for the purpose of issuing orders pursuant to these provisions. **A101.2 Application for appeal.** Any person shall have the right to appeal a decision of the code official to the board. An application for appeal shall be based on a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly					

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served. **A101.2.1 Limitation of authority.** The board shall not have authority to waive requirements of this code or interpret the administration of this code. **A101.2.2 Stays of enforcement.** Appeals of notice and orders, other than Imminent Danger notices, shall stay the enforcement of the notice and order until the appeal is heard by the board. **A101.3.3 Vacancies.** Vacancies shall be filled for an unexpired term in the same manner in which original appointments are required to be made. **A101.3.8 Removal from the board.** A member shall be removed from the board prior to the end of their terms only for cause. Any member with continued absence from regular meeting of the board may be removed at the discretion of the chief appointing authority. **A101.5.2 Quorum.** Three members of the board shall constitute a quorum. **A101.6 Legal counsel.** The jurisdiction shall furnish legal counsel to the board to provide members with general legal advice concerning matters before them for consideration. Members shall be represented by legal counsel at the jurisdiction's expense in all matters arising from service within the scope of their duties.					
F297-18 Part II	Change existing definition for [F] 1202.1 Nonflammable medical gases to: **[F] 1202.1 Nonflammable medical gases.** Nonflammable medical gas systems, inhalation anesthetic systems and vacuum piping systems shall be ~~designed~~ installed, tested and ~~installed~~ labeled in accordance with NFPA 99. **Exceptions:** 1. This section shall not apply to portable systems or cylinder storage. 2. Vacuum system exhaust terminations shall comply with the International Mechanical Code.		X			Clarification
M10-18	Add new definitions for 307.1.2 Identification and 307.2.3.3 Identification as follows: **307.1.2 Identification.** ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked		X			Clarification

Table 2. 2021 IPC Changes Cost Impact						
CODE CHANGE #	2021 IPC CHANGE SUMMARY	IPC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	to indicate whether the piping is connected to the primary or to the secondary drain. **307.2.3.3 Identification.** ~~Where condensate piping is concealed, primary and secondary drain pipes that serve the same appliance and terminate together at a remote location shall be identified.~~ The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or to the secondary drain.					
M11-18	Add new definitions for 307.2.1.1 (IPC [M] 314.2.1.1) Condensate discharge as follows: **307.2.1.1 (IPC [M] 314.2.1.1) Condensate discharge.** Condensate drains shall not directly connect to any plumbing drain, waste or vent pipe. Condensate drains shall not discharge into a plumbing fixture other than a floor sink, floor drain, trench drain, mop sink, hub drain, standpipe, utility sink or laundry sink. Condensate drain connections to a lavatory wye branch tailpiece or to a bathtub overflow pipe, shall not be considered as discharging to a plumbing fixture. Except where discharging to grade outdoors, the point of discharge of condensate drains shall be located within the same occupancy, tenant space or dwelling unit as the source of the condensate.		X			Necessary addition for clarification
M14-18	Change existing definition for 307.2.2 Drain pipe materials and sizes to: **307.2.2 Drain pipe materials and sizes.** Components of the condensate disposal system shall be ABS, cast ir~~o~~n, ~~galvanized steel~~, copper , and copper alloy, CPVC, cross-linked polyethylene, galvanized steel, PE-RT, polyethylene, ~~ABS~~ polypropylene, ~~CPVC,~~ PVC , or ~~polypropylene~~ PVDF pipe or tubing. Components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the International Plumbing Code relative to the material type. Condensate waste and drain line size shall be not less than $^{3}/_{4}$-inch pipe size ~~internal diameter~~ and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2.		X			Clarification

APPENDIX C

Table3. 2021 IFGC Changes Cost Impact						
CODE CHANGE #	2021 IFGC CHANGE SUMMARY	IFGC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
FG2-18	Add new definition for SERVICE METER ASSEMBLY as follows: **SERVICE METER ASSEMBLY.** The meter, valve, regulator, piping, fittings and equipment installed by the service gas supplier before the point of delivery.		X			Necessary addition for clarification
FG3-18	Add new definition for SYSTEM SHUTOFF as follows: **SYSTEM SHUTOFF. A valve installed after the point of delivery to shut off the entire piping system.**		X			Necessary addition for clarification
FG4-18	Change existing definition for VALVE to: **VALVE.** A device used in piping to control the gas supply to any section of a system of piping or to an appliance. **Service Shutoff.** A valve, installed by the serving gas supplier between the source of supply and the point of delivery, to shut off the entire piping system.		X			Clarification
FG6-18	Change existing definition for REGULATOR, MONITORING to: **REGULATOR, MONITORING.** A pressure regulator set in series with another pressure regulator for the purpose of ~~automatically taking control of the pressure downstream of the monitored regulator when that pressure exceeds a set minimum~~ preventing an overpressure in the downstream piping system.		X			Clarification
FG7-18	Change existing definition for POINT OF DELIVERY to: **POINT OF DELIVERY.** For natural gas systems, the point of delivery is the outlet of the service meter assembly or the outlet of the service regulator or service shutoff valve where a meter is not provided. Where a system shutoff valve is provided ~~at~~ after the outlet of the service meter assembly, such valve shall be considered to be downstream of the point of delivery. For undiluted liquefied petroleum gas systems, the point of delivery shall be considered to be the outlet of the service pressure regulator, exclusive of line gas regulators, in the system.		X			Clarification
FG8-18	Add new definition for PRESS-CONNECT JOINT as follows: **PRESS-CONNECT JOINT.** A permanent mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion-resistant grip or bite ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.		X			Necessary addition for clarification
FG11-18	Change existing definition for 307.2 Fuel-burning appliances to: **307.2 Fuel-burning appliances.** Liquid combustion byproducts of condensing appliances shall be collected and discharged to an approved plumbing fixture or disposal area in accordance with the manufacturer's instructions. Condensate piping shall be of approved corrosion-resistant		X			Clarification

Table3. 2021 IFGC Changes Cost Impact						
CODE CHANGE #	2021 IFGC CHANGE SUMMARY	IFGC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	material and shall be not smaller than the drain connection on the appliance. Such piping shall maintain a minimum slope in the direction of discharge of not less than one-eighth unit vertical in 12 units horizontal (1-percent slope). ~~Where condensate piping is concealed, and the primary and secondary drain system pipes serving the same appliance terminate together at a remote location, the terminations shall be identified as to which is the primary or secondary drain.~~ The termination of concealed condensate piping shall be marked to indicate that the piping is connected to the primary drain or to the secondary drain.					
FG12-18	Change existing definition for 401.5 Identification to: **401.5 Identification.** For other than steel pipe and CSST, exposed *piping* shall be identified by a yellow label marked "Gas" in black letters. The marking shall be spaced at intervals not exceeding 5 feet (1524 mm). The marking shall not be required on ~~pipe~~ piping located in the same room as the *appliance* served. CSST shall be identified as required by ANSI LC 1/CSA 6.26.	X			Minimal	Clarification
FG14-18	Change existing definition for 404.5 Fittings in concealed locations to: **404.5 Fittings in concealed locations.** Fittings installed in concealed locations shall be limited to the following types: 1. Threaded ~~Right-handed-threaded~~ elbows, tees, couplings, plugs and caps. 2. Brazed fittings. 3. Welded fittings. 4. Fittings listed to ANSI LC-1/CSA 6.26 or ANSI LC-4.		X			Clarification
FG17-18	Delete the existing definition for 404.11.5 Prohibited use.		X			Clarification
FG18-18	Change the existing definition for 404.18 Pipe cleaning to: **404.18 Pipe ~~cleaning~~ debris removal.** The interior of piping shall be clear of debris. The use of a flammable or combustible gas to clean or remove debris from a *piping* system shall be prohibited.		X			Clarification
FG21-18	Change existing definition for 411.1 Connecting appliances to: **411.1 Connecting appliances.** Except as required by Section 411.1.1, appliances shall be connected to the *piping* system by one of the following: 1. Rigid metallic pipe and fittings. 2. Corrugated stainless steel tubing (CSST) where installed in accordance with the manufacturer's instructions. 3. Semirigid metallic tubing and metallic fittings. Lengths shall not exceed 6 feet (1829 mm) and shall be located entirely in the same room as the		X			Clarification

Table3. 2021 IFGC Changes Cost Impact						
CODE CHANGE #	2021 IFGC CHANGE SUMMARY	IFGC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	appliance. Semirigid metallic tubing shall not enter a motor-operated *appliance* through an unprotected knockout opening. 4. *Listed* and labeled appliance connectors in compliance with ANSI Z21.24/CGA 6.10 and installed in accordance with the manufacturer's instructions and located entirely in the same room as the appliance. 5. *Listed* and *labeled* quick-disconnect devices <u>in compliance with ANSI Z21.41/CGA 6.9</u> used in conjunction with *listed* and labeled appliance connectors. 6. *Listed* and *labeled* convenience outlets <u>in compliance with ANSI Z21.90/CGA 6.24</u> used in conjunction with *listed* and labeled appliance connectors. 7. Listed and *labeled* outdoor *appliance* connectors in compliance with ANSI Z21.75/CSA 6.27 and installed in accordance with the manufacturer's instructions. 8. Listed outdoor gas hose connectors in compliance with ANSI Z21.54 used to connect portable outdoor appliances. The gas hose connection shall be made only in the outdoor area where the appliance is used, and shall be to the gas *piping* supply at an appliance shutoff valve, a listed quick-disconnect device or listed gas convenience outlet. 9. Gas hose connectors for use in laboratories and educational facilities in accordance with Section 411.4. **CHAPTER 8** **REFERENCED STANDARDS** Add new standards for ANSI Z21.41/CSA 6.9-2014 and ANSI Z21.90/CSA 6.24-2015 as follows: **<u>ANSI</u>** <u>ANSI Z21.41/CSA 6.9-2014</u>: <u>Quick disconnect devices for use with gas fuel appliances</u> <u>ANSI Z21.90/CSA 6.24-2015</u>: <u>Gas convenience outlets and optional enclosures</u>					
FG22-18	Change the existing definition for SECTION 413 (IFGC) [F] 413.2.3 General, [F] 413.4 Residential fueling appliance installation, [F] 413.5 Private fueling of motor vehicles, [F] 413.6 Pressure regulators, [F] 413.7 Valves, [F] 413.8 Emergency shutdown control, [F] 413.9 Discharge of CNG from motor vehicle fuel storage containers, [F] 413.9.1 Closed transfer		X			Clarification

Table3. 2021 IFGC Changes Cost Impact						
CODE CHANGE #	2021 IFGC CHANGE SUMMARY	IFGC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	system, [F] 413.9.2 Atmospheric venting, [F] 413.9.2.1 Plans and specifications, [F] 413.9.2.2 Cylinder stability, [F] 413.9.2.3 Separation, [F] TABLE 413.9.2.3 SEPARATION DISTANCE FOR ATMOSPHERIC VENTING OF CNG, [F] 413.9.2.4 Grounding and bonding, [F] 413.9.2.5 Vent tube and [F] 413.9.2.6 Signage to: ~~[F]~~ **413.2.3 ~~General~~ Residential Fueling Appliances.** Residential fueling appliances shall be ~~in accordance with Section 413.4.~~listed to CSA/ANSI NGV 5.1. The capacity of a residential fueling appliance (RFA) shall not exceed 5 standard cubic feet per minute (0.14 standard cubic meter/min) of natural gas. **[F] 413.4 Residential fueling appliance installation.** Residential fueling appliances shall be installed in accordance with ~~Sections 413.4.1 through 413.4.3~~ requirements of CSA/ANSI NGV 5.1, manufacturer installation instructions, and Section 2308 of the International Fire Code for RFAs. **[F] ~~413.5~~ 413.6 Private fueling of motor vehicles.** Self-service CNG-dispensing systems, including key, code and card lock dispensing systems, shall be limited to the filling of permanently mounted fuel containers on CNG-powered vehicles. **[F] ~~413.6~~ 413.7 Pressure regulators.** Pressure regulators shall be designed, installed or protected so their operation will not be affected by the elements (freezing rain, sleet, snow, ice, mud or debris). This protection is allowed to be integral with the regulator. **[F] ~~413.7~~ 413.8 Valves.** *Piping* to *equipment* shall be provided with a remote manual shutoff valve. Such valve shall be provided with ready access. **[F] ~~413.8~~ 413.9 Emergency shutdown control.** An emergency shutdown device shall be located within 75 feet (22 860 mm) of, but not less than 25 feet (7620 mm) from, dispensers and shall also be provided in the compressor area. Upon activation, the emergency shutdown system shall automatically shut off the power supply to the compressor and close valves between the main gas supply and the compressor and between the storage containers and dispensers. **[F] ~~413.9~~ 413.10 Discharge of CNG from motor vehicle fuel storage containers.** The discharge of CNG from motor vehicle fuel cylinders for the purposes of maintenance, cylinder certification, calibration of dispensers or other activities shall be in accordance with this section. The discharge of CNG from motor vehicle fuel cylinders shall be accomplished through a closed transfer system or an *approved* method of atmospheric venting in accordance with Section 413.9.1 or 413.9.2.					

Table3. 2021 IFGC Changes Cost Impact						
CODE CHANGE #	2021 IFGC CHANGE SUMMARY	IFGC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	[F] ~~413.9.1~~ 413.10.1 Closed transfer system. A documented procedure that explains the logical sequence for discharging the cylinder shall be provided to the code official for review and approval. The procedure shall include what actions the operator will take in the event of a low-pressure or high-pressure natural gas release during the discharging activity. A drawing illustrating the arrangement of *piping*, regulators and *equipment* settings shall be provided to the code official for review and approval. The drawing shall illustrate the *piping* and regulator arrangement and shall be shown in spatial relation to the location of the compressor, storage vessels and emergency shutdown devices. **[F] ~~413.9.2~~ 413.10.2 Atmospheric venting.** Atmospheric venting of motor vehicle fuel cylinders shall be in accordance with Sections 413.9.2.1 through 413.9.2.6. **[F] ~~413.9.2.1~~ 413.10.2.1 Plans and specifications.** A drawing illustrating the location of the vessel support, *piping*, the method of grounding and bonding, and other requirements specified herein shall be provided to the code official for review and approval. **[F] ~~413.9.2.2~~ 413.10.2.2 Cylinder stability.** A method of rigidly supporting the vessel during the venting of CNG shall be provided. The selected method shall provide not less than two points of support and shall prevent horizontal and lateral movement of the vessel. The system shall be designed to prevent movement of the vessel based on the highest gas-release velocity through valve orifices at the vessel's rated pressure and volume. The structure or appurtenance shall be constructed of *noncombustible materials*. **[F] ~~413.9.2.3~~ 413.10.2.3 Separation.** The structure or appurtenance used for stabilizing the cylinder shall be separated from the site *equipment*, features and exposures and shall be located in accordance with Table 413.9.2.3. **[F] TABLE ~~413.9.2.3~~ 413.10.2.3** **SEPARATION DISTANCE FOR ATMOSPHERIC VENTING OF CNG** **[F] ~~413.9.2.4~~ 413.10.2.4 Grounding and bonding.** The structure or appurtenance used for supporting the cylinder shall be grounded in accordance with NFPA 70. The cylinder valve shall be bonded prior to the commencement of venting operations. **[F] ~~413.9.2.5~~ 413.10.2.5 Vent tube.** A vent tube that will divert the gas flow to the atmosphere shall be installed on the cylinder prior to the commencement of the venting and purging operation. The vent tube shall be constructed of pipe or tubing materials *approved* for use with CNG in accordance with the International Fire Code.					

Table3. 2021 IFGC Changes Cost Impact						
CODE CHANGE #	2021 IFGC CHANGE SUMMARY	IFGC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	[F] ~~413.9.2.6~~ 413.10.2.6 Signage. Approved NO SMOKING signs shall be posted within 10 feet (3048 mm) of the cylinder support structure or appurtenance. *Approved* CYLINDER SHALL BE BONDED signs shall be posted on the cylinder support structure or appurtenance. Add new definition for 413.2.4 Non-residential fueling appliances, and 413.5 Non-residential fueling appliance installation as follows: **413.2.4 Non-residential fueling appliances.** Non-residential fueling appliances shall be listed to CSA/ANSI NGV 5.2. The capacity of a non-residential fueling appliance, listed to that standard as a vehicle fueling appliance (VFA), shall not exceed 10 standard cubic feet per minute (0.28 standard cubic meter/min) of natural gas. **413.5 Non-residential fueling appliance installation.** Non-residential fueling appliances shall be installed in accordance with requirements for vehicle fueling appliances (VFA) in CSA/ANSI NGV 5.2, manufacturer installation instructions, and Section 2308 of the International Fire Code for VFAs. Delete the existing definition for [F] 413.4.1 Listing and installation, [F] 413.4.2 Gas connection, and [F] 413.4.3 Indoor installation. Update standards for CSA/ANSI NGV 5.1-2016 and 5.2-2017.					
FG23-18	Change existing definition for 602.1 General, 602.2 Flame safeguard device, 603.1 General, 604.1 General, 605.1 General, 608.1 General, 609.1 General, 610.1 General, 613.1 General, 617.1 General, 618.1 General, 620.1 General, 621.1 General, 622.1 General, 623.1 Cooking appliances, 624.1 General, 625.1 General, 626.1 General, 627.1 General, 628.1 General, 630.1 General, and 636.1 General to: **602.1 General.** Decorative appliances for installation in *approved* solid fuel-burning fireplaces shall be ~~tested~~ listed in accordance with ANSI Z21.60/CSA 6.26 and shall be installed in accordance with the manufacturer's instructions. Manually lighted natural gas decorative appliances shall be ~~tested~~ listed in accordance with ANSI Z21.84. **602.2 Flame safeguard device.** Decorative appliances for installation in approved solid fuel-burning fireplaces, with the exception of those ~~tested~~ listed in accordance with ANSI Z21.84, shall utilize a direct ignition device, an ignitor or a pilot flame to ignite the fuel at the main burner, and shall be equipped with a flame safeguard device. The flame safeguard device shall automatically shut off the fuel supply to a main burner or group		X			Clarification

Table3. 2021 IFGC Changes Cost Impact						
CODE CHANGE #	2021 IFGC CHANGE SUMMARY	IFGC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	of burners when the means of ignition of such burners becomes inoperative. **603.1 General.** Log lighters shall be ~~tested~~ listed in accordance with CSA 8 and installed in accordance with the manufacturer's instructions. **604.1 General.** Vented gas fireplaces shall be ~~tested~~ listed in accordance with ANSI Z21.50/CSA 2.22, shall be installed in accordance with the manufacturer's instructions and shall be designed and equipped as specified in Section 602.2. **605.1 General.** Vented gas fireplace heaters shall be installed in accordance with the manufacturer's instructions, shall be ~~tested~~ listed in accordance with ANSI Z21.88/CSA 2.33 and shall be designed and equipped as specified in Section 602.2. **608.1 General.** Vented wall furnaces shall be ~~tested~~ listed in accordance with ANSI Z21.86/CSA 2.32 and shall be installed in accordance with the manufacturer's instructions. **609.1 General.** Floor furnaces shall be ~~tested~~ listed in accordance with ANSI Z21.86/CSA 2.32 and shall be installed in accordance with the manufacturer's instructions. **610.1 General.** Duct furnaces shall be ~~tested~~ listed in accordance with ANSI Z83.8/CSA 2.6 or UL 795 and shall be installed in accordance with the manufacturer's instructions. **613.1 General.** Clothes dryers shall be ~~tested~~ listed in accordance with ANSI Z21.5.1/CSA 7.1 or ANSI Z21.5.2/CSA 7.2 and shall be installed in accordance with the manufacturer's instructions. **617.1 General.** Pool and spa heaters shall be ~~tested~~ listed in accordance with ANSI Z21.56/CSA 4.7 and shall be installed in accordance with the manufacturer's instructions. **618.1 General.** Forced-air warm-air furnaces shall be ~~tested~~ listed in accordance with ANSI Z21.47/CSA 2.3 or UL 795 and shall be installed in accordance with the manufacturer's instructions. **620.1 General.** Unit heaters shall be ~~tested~~ listed in accordance with ANSI Z83.8/CSA 2.6 and shall be installed in accordance with the manufacturer's instructions. **621.1 General.** Unvented room heaters shall be ~~tested~~ listed in accordance with ANSI Z21.11.2 and shall be installed in accordance with the conditions of the listing and the manufacturer's instructions. Unvented room heaters utilizing fuels other than fuel gas shall be regulated by the International Mechanical Code. **622.1 General.** Vented room heaters shall be ~~tested~~ listed in accordance with ANSI Z21.86/CSA 2.32, shall be designed and					

Table3. 2021 IFGC Changes Cost Impact						
CODE CHANGE #	2021 IFGC CHANGE SUMMARY	IFGC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	equipped as specified in Section 602.2 and shall be installed in accordance with the manufacturer's instructions. **623.1 Cooking appliances.** Cooking appliances that are designed for permanent installation, including ranges, ovens, stoves, broilers, grills, fryers, griddles, hot plates and barbecues, shall be ~~tested~~ listed in accordance with ANSI Z21.1, ANSI Z21.58/CSA 1.6 or ANSI Z83.11/CSA 1.8 and shall be installed in accordance with the manufacturer's instructions. **624.1 General.** Water heaters shall be ~~tested~~ listed in accordance with ANSI Z21.10.1/CSA 4.1 ~~and~~ or ANSI Z21.10.3/CSA 4.3 and shall be installed in accordance with the manufacturer's instructions. **625.1 General.** Refrigerators shall be ~~tested~~ listed in accordance with ANSI Z21.19/CSA 1.4 and shall be installed in accordance with the manufacturer's instructions. **626.1 General.** Gas-fired toilets shall be ~~tested~~ listed in accordance with ANSI Z21.61 and installed in accordance with the manufacturer's instructions. **627.1 General.** Gas-fired air-conditioning appliances shall be ~~tested~~ listed in accordance with ANSI Z21.40.1/~~CGA~~ CSA 2.91 or ANSI Z21.40.2/~~CGA~~ CSA 2.92 and shall be installed in accordance with the manufacturer's instructions. **628.1 General.** Illuminating appliances shall be ~~tested~~ listed in accordance with ANSI Z21.42 and shall be installed in accordance with the manufacturer's instructions. **630.1 General.** Infrared radiant heaters shall be ~~tested~~ listed in accordance with ANSI Z83.19 or Z83.20 and shall be installed in accordance with the manufacturer's instructions. **636.1 General.** Permanently fixed-in-place outdoor decorative appliances shall be ~~tested~~ listed in accordance with ANSI Z21.97 and shall be installed in accordance with the manufacturer's instructions.					
FG24-18	Change existing definition for 611.2 Installation to: **611.2 Installation.** Nonrecirculating direct-fired industrial air heaters shall be ~~installed only in industrial or commercial occupancies. Nonrecirculating direct-fired industrial air heaters shall be~~ permitted to provide ventilation air.		X			Clarification
FG25-18	Change existing definition for 612.2 Location to: **612.2 Location.** Recirculating direct-fired ~~industrial air heaters shall be installed only in industrial and commercial occupancies. Recirculating direct-fired~~ air heaters shall not serve any area containing sleeping quarters. Recirculating direct-fired industrial air heaters shall not be installed in hazardous locations or in buildings that contain flammable solids, liquids or gases,		X			Clarification

Table3. 2021 IFGC Changes Cost Impact						
CODE CHANGE #	**2021 IFGC CHANGE SUMMARY**	**IFGC COST IMPACT**			**ESTIMATED AMOUNT***	**BENEFIT OF CHANGE**
		Decrease	**None**	**Increase**		
Sub Code:						
	explosive materials or substances that can become toxic when exposed to flame or heat.					
FG26-18	Change existing definition for [M] 614.6 Makeup air to: **[M] 614.6 Makeup air.** Installations exhausting more than 200 cfm (0.09 m^3/s) shall be provided with makeup air. ~~Where a closet is designed for the installation of a clothes dryer, an opening having an area of not less than 100 square inches (645 mm^2)~~ for makeup air shall be provided in the closet enclosure, or ~~makeup air shall be provided by other *approved* means.~~ Add new definition for [M] 614.6.1 Closet Installation as follows: **[M]614.6.1 Closet Installation.** Where a closet is designed for the installation of a clothes dryer, an opening having an area of not less than 100 square inches (645 mm^2) for makeup air shall be provided in the closet enclosure, or makeup air shall be provided by other approved means.		X			Clarification
FG28-18	Change existing definition for 623.2 Prohibited location to: **623.2 Prohibited location.** Cooking appliances designed, tested, *listed* and *labeled* for use in commercial occupancies shall not be installed within dwelling units or within any area where domestic cooking operations occur. **Exceptions:** 1. Appliances that are also listed as domestic cooking appliances. ~~2. Where the installation is designed by a licensed Professional Engineer, in compliance with the manufacturer's installation instructions.~~		X			Clarification

APPENDIX D

Table 4. 2021 IRC Mechanical Changes Cost Impact						
CODE CHANGE #	2021 IRC MECHANICAL CHANGE SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RM1-18	**CHAPTER 21** **HYDRONIC PIPING** **PRESS-CONNECT JOINT.** A permanent mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion-resistant grip or bite ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.		X			Necessary addition for clarification
RM3-18	**M1307.7 Prohibited support.** Gypsum board shall not be used as a support base under an appliance.		X			Necessary addition for clarification
RM9-18	**M1411.3.1.2 Appliance, equipment and insulation in pans.** Where appliances, equipment or insulation are subject to water damage when auxiliary drain pans fill, that portion of the appliance, equipment and insulation shall be installed above the rim of the pan. Supports located inside of the pan to support the appliance or equipment shall be water resistant and approved.		X			Necessary addition for clarification
RM10-18	**M1411.6 Insulation of refrigerant piping.** Piping and fittings for refrigerant vapor (suction) lines shall be insulated with insulation having a thermal resistivity of not less than R-~~4~~ 3 and having external surface permeance not exceeding 0.05 perm [2.87 ng/(s • m^2 • Pa)] when tested in accordance with ASTM E96.	X			Decreasing insulation thermal resistivity may minimally decrease cost	Clarification
RM11-18	**M1411.8 Support of Refrigerant piping.** Refrigerant piping & tubing shall be securely fastened to a permanent support within 6 feet of the ~~compressor~~ condensing unit. ~~and within 3 feet of each subsequent bend or angle.~~	X			Minimal	Decrease cost and ease design and construction
RM13-18	**M1502.3 Duct termination.** Exhaust ducts shall terminate on the outside of the building. Exhaust duct terminations shall be in accordance with the dryer manufacturer's installation instructions. If the manufacturer's instructions do not specify a termination location, the exhaust duct shall terminate not less than 3 feet (914 mm) in any direction from openings into buildings including openings in ventilated soffits. Exhaust duct terminations shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination.			X	Cost may increase $75 per Dyer with extended duct	Clarification
RM22-18	**BALANCED VENTILATION.** Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate ~~and~~ is within 10% of the total mechanical supply airflow rate ~~are substantially the same~~.		X			Provide reasonable building

<table>
<tr><th colspan="7">Table 4. 2021 IRC Mechanical Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IRC MECHANICAL CHANGE SUMMARY</th><th colspan="3">IRC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>M1505.4.3 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate as determined in accordance with Table M1505.4.3(1) or Equation 15-1.
Ventilation rate in cubic feet per minute =0.01~~ x~~ total square foot area of house + ~~7.5×number~~ 7.5 number of bedrooms + 1 (Equation 15-1)
Exceptions:
1. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1) is multiplied by the factor determined in accordance with Table M1505.4.3(2).
2. The minimum mechanical ventilation rate determined in accordance with Table M1505.4.3(1) or Equation 15-1 shall be reduced by ~~25%~~ 30%, provided that ~~all~~ both of the following conditions apply:
2.1. A ducted system supplies ~~recirculated~~ ventilation air directly to each bedroom and ~~the largest common area.~~
~~2.2. For continuously operating systems, not less than 70% of the air volume in the conditioned space is recirculated each hour through a ducted system, or for intermittently operating systems, an equivalent air recirculation is provided during each four hour period.~~to one or more of the following rooms:
2.1.1. Living room
2.1.2. Dinning room
2.1.3. Kitchen
2.2.~~2.3~~The whole-house ventilation system is a balanced ventilation system.</td><td></td><td></td><td></td><td></td><td>pressurization, if needed.</td></tr>
<tr><td>RM23-18</td><td>TABLE M1505.4.4
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS
<table><tr><th>AREA TO BE EXHAUSTED</th><th>EXHAUST RATES[a]</th></tr><tr><td>Kitchens</td><td>100 cfm intermittent or 25 cfm continuous</td></tr><tr><td>Bathrooms-Toilet Rooms</td><td>Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous</td></tr></table>For SI: 1 cubic foot per minute = 0.0004719 m^3/s.
a. The listed exhaust rate for bathrooms-toilet rooms shall equal or exceed the exhaust rate at a minimum static pressure of 0.25 inch wc in accordance with Section M1505.3.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 4. 2021 IRC Mechanical Changes Cost Impact						
CODE CHANGE #	2021 IRC MECHANICAL CHANGE SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RM24-18	**BALANCED VENTILATION SYSTEM.** A ventilation system where the total supply airflow and total exhaust airflow are simultaneously within 10% of their average. The balanced ventilation system airflow is the average of the supply and exhaust airflows. **M1505.1 General.** Where local exhaust or whole-house mechanical ventilation is provided, the ~~equipment~~ ventilation system shall be designed in accordance with this section. **M1505.4.3 Mechanical ventilation rate.** The whole house mechanical ventilation system shall provide outdoor air at a continuous rate ~~as~~ not less than that determined in accordance with Table M1505.4.3(1) or not less than that determined by Equation 15-1. Ventilation rate in cubic feet per minute = (0.01 × total square foot area of house) + [7.5 × (number of bedrooms + 1) **(Equation 15-1)** **Exceptions:** 1. Ventilation rate credit. Where a whole-house mechanical balanced ventilation system is provided, the whole-house mechanical ventilation system rate shall be permitted to be adjusted by multiplying the ventilation rate determined in accordance with Table M1505.4.3(1) or by Equation 15-1 by 0.7. 2. Programmed intermittent operation. The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1), by Equation 15-1, or by Exception 1 is multiplied by the factor determined in accordance with Table M1505.4.3(2).	X			Minimal	The 10% average improves on RM-22
RM29-18	**M1505.4.2 System controls.** The whole-house mechanical ventilation system shall be provided with controls that enable manual override. Controls shall include text or a symbol indicating their function.			X	Minimal $50 each	Clarification
RM30-18	**M1505.3 Exhaust equipment.** Exhaust ~~equipment serving single dwelling units~~ fans and whole-house mechanical ventilation fans shall be listed and labeled as providing the minimum required airflow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51.		X			Clarification
RM32-18	**M1601.1.1 Above-ground duct systems.** Above-ground duct systems shall conform to the following: 1. Equipment connected to duct systems shall be designed to limit discharge air temperature to not greater than 250°F (121°C).		X			Clarification

Table 4. 2021 IRC Mechanical Changes Cost Impact						
CODE CHANGE #	2021 IRC MECHANICAL CHANGE SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	2. Factory-made ducts shall be listed and labeled in accordance with UL 181 and installed in accordance with the manufacturer's instructions. 3. Fibrous glass duct construction shall conform to the SMACNA Fibrous Glass Duct Construction Standards or NAIMA Fibrous Glass Duct Construction Standards. 4. Field-fabricated and shop-fabricated metal and flexible duct constructions shall conform to the SMACNA HVAC Duct Construction Standards-—Metal and Flexible except as allowed by Table M1601.1.1. Galvanized steel shall conform to ASTM A653. 5. The use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation. 6. Duct systems shall be constructed of materials having a flame spread index of not greater than 200. 7. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions: 7.1. These cavities or spaces shall not be used as a plenum for supply air. 7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly. 7.3. Stud wall cavities shall not convey air from more than one floor level. 7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fireblocking in accordance with Section ~~R602.8.~~R302.11. Fireblocking materials used for isolation shall comply with Section R302.11.1. 7.5. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums. 8. Volume dampers, equipment and other means of supply, return and exhaust air adjustment used in system balancing shall be provided with access. **M1601.4.5 Fireblocking.** Duct installations shall be fireblocked in accordance with Section ~~R602.8~~ R302.11.					
RM33-18	**M1601.1.1.7 Sealing.** Building cavities used as plenums shall be sealed.			X	Sealing $2.00 Sqft.	Necessary addition for clarification
RM34-18	**M1802.4 Blocked vent switch.** ~~The venting system for oil~~ Oil-fired appliances shall be equipped with a device that will stop burner operation in the event that the venting system is obstructed. Such			X	$150 per unit	Clarification

Table 4. 2021 IRC Mechanical Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IRC MECHANICAL CHANGE SUMMARY</th><th colspan="3">IRC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>device shall have a manual reset, and shall be installed in accordance with the manufacturer's instructions.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>RM35-18</td><td>M2101.14 Preparation of pipe ends. Pipe shall be cut square~~,~~ ~~reamed~~, and shall be free of burrs and obstructions. ~~CPVC, PE, and PVC pipe shall be chamfered.~~ Pipe ends shall have full-bore openings and shall ~~not be undercut.~~ be prepared in accordance with the pipe manufacturer's instructions.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>RM36-18</td><td>TABLE M2105.4
GROUND-SOURCE LOOP PIPE<table><tr><th>MATERIAL</th><th>STANDARD</th></tr><tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F441; ASTM F442; CSA B137.6</td></tr><tr><td>Cross-linked polyethylene (PEX)</td><td>ASTM F876; CSA B137.5; CSA C448</td></tr><tr><td>High-density polyethylene (HDPE)</td><td>ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1</td></tr><tr><td>Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe</td><td>ASTM F1282; AWWA C 903; CSA B137.9</td></tr><tr><td>Polypropylene (PP-R)</td><td>ASTM F2389; CSA B137.11, NSF 358-2</td></tr><tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D1785; ASTM D2241; CSA 137.3</td></tr><tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM F2623; ASTM F2769, CSA B137.18; CSA C448</td></tr></table></td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>RM38-18</td><td>TABLE M2105.5
GROUND-SOURCE LOOP PIPE FITTINGS<table><tr><th>PIPE MATERIAL</th><th>STANDARD</th></tr><tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F437; ASTM F438; ASTM</td></tr></table></td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 4. 2021 IRC Mechanical Changes Cost Impact

<table>
<tr><th>CODE CHANGE #</th><th>2021 IRC MECHANICAL CHANGE SUMMARY</th><th colspan="3">IRC COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th></th><th></th><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td></td><td>
<table>
<tr><td></td><td>F439; ASTM F1970; CSA B137.6</td></tr>
<tr><td>Cross-linked polyethylene (PEX)</td><td>ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5; CSA C448</td></tr>
<tr><td>High-density polyethylene (HDPE)</td><td>ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1</td></tr>
<tr><td>Polyethylene/aluminum/polyethylene (PE-AL-PE)</td><td>ASTM F1282; ASTM F2434; CSA B137.9</td></tr>
<tr><td>Polypropylene (PP-R)</td><td>ASTM F2389; CSA B137.11; NSF 358-2</td></tr>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D2464; ASTM D2466; ASTM D2467; ASTM F1970, CSA B137.2; CSA B137.3</td></tr>
<tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18; CSA C448</td></tr>
</table>
</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>RM39-18</td><td>
TABLE M2105.4
GROUND-SOURCE LOOP PIPE
<table>
<tr><th>MATERIAL</th><th>STANDARD</th></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F441; ASTM F442; CSA B137.6</td></tr>
<tr><td>Cross-linked polyethylene (PEX)</td><td>ASTM F876; CSA B137.5</td></tr>
</table>
</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 4. 2021 IRC Mechanical Changes Cost Impact

CODE CHANGE #	2021 IRC MECHANICAL CHANGE SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						

High-density polyethylene (HDPE)	ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F1282; AWWA C 903; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11, NSF 358-2
Polyvinyl chloride (PVC)	ASTM D1785; ASTM D2241; CSA 137.3
Raised temperature polyethylene (PE-RT)	ASTM F2623; ASTM F2769, CSA B137.18, NSF358-4

TABLE M2105.5
GROUND-SOURCE LOOP PIPE FITTINGS

PIPE MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC)	ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F1970; CSA B137.6
Cross-linked polyethylene (PEX)	ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434; CSA B137.5
High-density polyethylene (HDPE)	ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1
Polyethylene/aluminum/polyethylene (PE-AL-PE)	ASTM F1282; ASTM F2434; CSA B137.9
Polypropylene (PP-R)	ASTM F2389; CSA B137.11; NSF 358-2

Table 4. 2021 IRC Mechanical Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IRC MECHANICAL CHANGE SUMMARY</th><th colspan="3">IRC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td></td><td><table>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D2464; ASTM D2466; ASTM D2467; ASTM F1970, CSA B137.2; CSA B137.3</td></tr>
<tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18, NSF 358-4</td></tr>
</table></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>RM40-18</td><td>TABLE M2105.4
GROUND-SOURCE LOOP PIPE<table>
<tr><th>MATERIAL</th><th>STANDARD</th></tr>
<tr><td>Chlorinated polyvinyl chloride (CPVC)</td><td>ASTM D2846; ASTM F437; ASTM F438; ASTM F439; ASTM F441; ASTM F442; CSA B137.6</td></tr>
<tr><td>Cross-linked polyethylene (PEX)</td><td>ASTM F876; CSA B137.5, NSF 358-3</td></tr>
<tr><td>High-density polyethylene (HDPE)</td><td>ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1</td></tr>
<tr><td>Polyethylene/aluminum/ polyethylene (PE-AL-PE) pressure pipe</td><td>ASTM F1282; AWWA C 903; CSA B137.9</td></tr>
<tr><td>Polypropylene (PP-R)</td><td>ASTM F2389; CSA B137.11, NSF 358-2</td></tr>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D1785; ASTM D2241; CSA 137.3</td></tr>
<tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM F2623; ASTM F2769, CSA B137.18</td></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>Adds another acceptable standard for these materials</td></tr>
</table>

Table 4. 2021 IRC Mechanical Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IRC MECHANICAL CHANGE SUMMARY</th><th colspan="3">IRC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>TABLE M2105.5
GROUND-SOURCE LOOP PIPE FITTINGS
<table>
<tr><th>PIPE MATERIAL</th><th>STANDARD</th></tr>
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<tr><td>High-density polyethylene (HDPE)</td><td>ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1</td></tr>
<tr><td>Polyethylene/aluminum/ polyethylene (PE-AL-PE) pressure pipe</td><td>ASTM F1282; ASTM F2434; CSA B137.9</td></tr>
<tr><td>Polypropylene (PP-R)</td><td>ASTM F2389; CSA B137.11, NSF 358-2</td></tr>
<tr><td>Polyvinyl chloride (PVC)</td><td>ASTM D2464; ASTM D2466; ASTM D2467; ASTM F1970, CSA B137.2; CSA B137.3</td></tr>
<tr><td>Raised temperature polyethylene (PE-RT)</td><td>ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18</td></tr>
</table></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>RM41-18</td><td>TABLE M2101.1
HYDRONIC PIPING AND FITTING MATERIALS
Reason: ASTM's committee on plastics piping recently completed a new Standard, F3253 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing with Oxygen Barrier for Hot - and Cold - Water Hydronic Distribution Systems. This new system standard covers both the oxygen barrier PEX tubing as well as the performance and material requirements for the fittings. While this standard essentially mirrors the existing ASTM F876 and F877 PEX standards from a dimensional standpoint and existing fittings interchangeability, it also mandates the inclusion of an oxygen barrier layer with defined pass/fail criteria essentially equal with the industry's long accepted norm of DIN 4726 concerning allowed oxygen permeation. This new standard also requires a minimum pull-out strength test for the fittings not included in ASTM F877</td><td></td><td>X</td><td></td><td></td><td>Offers an alternative that uses products which are relatively identical in cost to existing pipe and fitting materials.</td></tr>
</table>

Table 4. 2021 IRC Mechanical Changes Cost Impact						
CODE CHANGE #	2021 IRC MECHANICAL CHANGE SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	today. The inclusion of this new standard in no way changes the acceptance of the existing ASTM F876 and F877 which will remain in the mechanical hydronics code for the foreseeable future. This standard's project has been in works for nearly 4 years and represents the work and input from nearly all of the PEX tubing manufacturers in North America. Your support of this proposal is most appreciated. A similar proposal is being submitted for Chapter 12 of the IMC.					
RM42-18	**M2105.7 Preparation of pipe ends.** Pipe shall be cut square~~, reamed,~~ and shall be free of burrs and obstructions. ~~CPVC, PE and PVC pipe shall be chamfered.~~ Pipe ends shall have full-bore openings and shall ~~not be undercut.~~be prepared in accordance with the pipe manufacturer's instructions.		X			Clarification
RM43-18	**M2202.1 Materials.** Piping shall consist of steel pipe, copper and copper-alloy pipe and tubing, steel tubing conforming to ASTM A539 or stainless steel tubing conforming to ASTM A254 or ASTM ~~A539.~~ A269. Aluminum tubing shall not be used between the fuel-oil tank and the burner units.		X			Clarification
RM45-18	**M2202.2 Joints and fittings.** Piping shall be connected with ~~standard~~ fittings compatible with the piping material. Cast-iron fittings shall not be used for oil piping. Unions requiring gaskets or packings, right or left couplings, and sweat fittings employing solder having a melting point less than 1,000°F (538°C) shall not be used for oil piping. Threaded joints and connections shall be made tight with a lubricant or pipe thread compound.		X			Clarification
M53-18 Part II	Add new definition for 1502.4.5 Booster fans prohibited as follows: **M1502.4.5 Booster fans prohibited.** Domestic booster fans shall not be installed in dryer exhaust systems.		X			Necessary addition for clarification
M86-18 Part II	Change existing definitions for M1402.1 General and M2006.1 General to: **M1402.1 General.** Oil-fired central furnaces shall conform to ANSI/UL 727. Electric furnaces shall conform to UL 1995 or UL/CSA 60335-2-40. **M2006.1 General.** Pool and spa heaters shall be installed in accordance with the manufacturer's installation instructions. Oil-fired pool heaters shall comply with UL 726. Electric pool and spa heaters shall comply with UL 1261. Pool and spa heat pump water heaters shall comply with UL 1995, UL/CSA 60335-2-40 or CSA C22.2 No. 236. **Exception:** Portable residential spas and portable residential exercise spas shall comply with UL 1563 or CSA C22.2 No. 218.1.		X			UL 60335-2-40 harmonized with requirements in Canada and Europe to includeprovisions for most current - technology and use of flammable refrigerants and is currently

Table 4. 2021 IRC Mechanical Changes Cost Impact						
CODE CHANGE #	2021 IRC MECHANICAL CHANGE SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
						being used to list new products.

APPENDIX E

Table 5. 2021 IRC Plumbing Changes Cost Impact						
CODE CHANGE #	2021 IRC PLUMBING CHANGE SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RP2-18	**P2503.5.1 Rough plumbing.** DWV systems shall be tested on completion of the rough piping installation by water or, for piping systems other than plastic, by air, without evidence of leakage. Either test shall be applied to the drainage system in its entirety or in sections after rough-in piping has been installed, as follows: 1. Water test. Each section shall be filled with water to a point not less than ~~5~~ 10 feet (~~1524~~ 3048 mm) above the highest fitting connection in that section, or to the highest point in the completed system. Water shall be held in the section under test for a period of 15 minutes. The system shall prove leak free by visual inspection. 2. Air test. The portion under test shall be maintained at a gauge pressure of 5 pounds per square inch (psi) (34 kPa) or 10 inches of mercury column (34 kPa). This pressure shall be held without introduction of additional air for a period of 15 minutes.		X			Provides the benefit of a more stringent test, subjecting the piping to more pressure.
RP4-18	**Add the following:** **P2709.4.1 Waste Fittings.** Flanged drains shall conform to ASME A112.18.2/CSA B125.2.		X			Necessary addition for clarification
RP5-18	**P2904.2.1 Temperature rating and separation from heat sources.** Except as provided for in Section P2904.2.2, sprinklers shall have a temperature rating of not less than 135°F (57°C) and not more than ~~170°F (77°C)~~ 225°F (107°C). Sprinklers shall be separated from heat sources as required by the sprinkler manufacturer's installation instructions.		X			Allows flexibility.
RP6-18	**P2904.2.3 Freezing areas.** Piping shall be protected from freezing as required by Section P2603.5 or by using one of the following: 1. A~~a~~ dry pipe automatic sprinkler system that is listed for residential occupancy applications. 2. ~~Where sprinklers are required in areas that are subject to freezing, d~~Dry-side-wall or dry-pendent sprinklers extending from a nonfreezing area into a freezing area ~~shall be installed~~.		X			Additional alternative to existing requirements for freeze protection
RP7-18	**P2904.3.2 Shutoff valves prohibited.** With the exception of shutoff valves for the entire water distribution system or a single master control valve for the automatic sprinkler system that is locked in the open position, valves shall not be installed in any location where the valve would isolate piping serving one or more sprinklers.		X			Adds an allowance to have a master control valve.
RP8-18	**P2904.4.1.3 Other Ceiling Configurations.** For ceiling configurations not addressed by Sections P2904.4.1.1 or P2904.4.1.2, the flow rate shall be subject to approval by the ~~fire~~ code official.	X			Minimal	Correlates with NFPA 13D and existing installation

Table 5. 2021 IRC Plumbing Changes Cost Impact

<table>
<tr><th>CODE CHANGE #</th><th>2021 IRC PLUMBING CHANGE SUMMARY</th><th colspan="3">IRC COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th></th><th></th><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>practices for residential sprinklers protecting spaces with sloped and/or beamed ceilings.</td></tr>
<tr><td>RP9-18</td><td>TABLE P2904.6.2(2)
MINIMUM WATER METER PRESSURE LOSS (PLm)[a]
<table>
<tr><th>FLOW RATE(gallons per minute, gpm)[b]</th><th>5/8-INCH METER PRESSURE LOSS (pounds per square inch, psi)</th><th>3/4-INCH METER PRESSURE LESS(pounds per square inch, psi)</th><th>1-INCH METER PRESSURE LOSS (pounds per square inch, psi)</th></tr>
<tr><td>8</td><td><s>2</s> 3</td><td><s>1</s> 3</td><td>1</td></tr>
<tr><td>10</td><td>3</td><td><s>1</s> 3</td><td>1</td></tr>
<tr><td>12</td><td>4</td><td><s>1</s> 3</td><td>1</td></tr>
<tr><td>14</td><td><s>5</s>6</td><td><s>2</s> 5</td><td>1</td></tr>
<tr><td>16</td><td>7</td><td><s>3</s> 6</td><td>1</td></tr>
<tr><td>18</td><td>9</td><td><s>4</s> 7</td><td><s>1</s> 2</td></tr>
<tr><td>20</td><td>11</td><td><s>4</s> 9</td><td>2</td></tr>
<tr><td><s>22</s> 23</td><td><s>NP</s> 14</td><td><s>5</s> 11</td><td><s>2</s> 3</td></tr>
<tr><td><s>24</s></td><td><s>NP</s></td><td><s>5</s></td><td><s>2</s></td></tr>
<tr><td>26</td><td><s>NP</s> 18</td><td><s>6</s> 14</td><td><s>2</s> 3</td></tr>
<tr><td><s>28</s></td><td><s>NP</s></td><td><s>6</s></td><td><s>2</s></td></tr>
<tr><td><s>30</s> 31</td><td><s>NP</s> 26</td><td><s>7</s> 22</td><td><s>2</s> 4</td></tr>
<tr><td><s>32</s> 39</td><td><s>NP</s> 38</td><td><s>7</s> 35</td><td><s>3</s> 6</td></tr>
<tr><td><s>34</s></td><td><s>NP</s></td><td><s>8</s></td><td><s>3</s></td></tr>
<tr><td><s>36</s> 52</td><td>NP</td><td><s>8</s> NP</td><td><s>3</s> 10</td></tr>
</table>
For SI: 1 inch = 25.4 mm, 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 0.063 L/s.
NP = Not permitted unless the actual water meter pressure loss is known.
a. Table P2904.6.2(2) establishes conservative values for water meter pressure loss or installations where the water meter loss is unknown. Where the actual water meter pressure loss is <s>known</s> published and available from the meter manufacturer, P_m shall be the <s>actual loss.</s> published pressure loss for the selected meter.
b. Flow rate from Section P2904.4.2. Add 5 gpm to the flow rate required by Section P2904.4.2 where the water service pipe supplies more than one dwelling.</td><td></td><td>X</td><td></td><td></td><td>Revises the water meter table in the IRC to better correlate with the water meter table in NFPA 13D, which was updated in the 2013 edition based on research that was published in an Fire Protection Research Foundation Report titled, " Residential Fire Sprinklers - Water Usage and Water Meter performance Study" in 2011.</td></tr>
<tr><td>RP10-18</td><td>P2905.3 Hot water supply to fixtures. The developed length of hot water piping, from the source of hot water to the fixtures that require hot water, shall not exceed <s>50</s> 100 feet <s>(15 240 mm)</s>. Water heaters</td><td></td><td>X</td><td></td><td></td><td>Increases the hot water supply line</td></tr>
</table>

Table 5. 2021 IRC Plumbing Changes Cost Impact						
CODE CHANGE #	2021 IRC PLUMBING CHANGE SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	and recirculating system piping shall be considered to be sources of hot ~~or tempered~~ water.					length from the source of hot water to the fixtures that require hot or tempered water.
RP11-18	**P2906.21 Push-fit joints.** Push-fit joints shall be used only on copper-tube-size outside diameter dimensioned CPVC, PEX, PE-RT, and copper tubing. Push-fit joints shall conform to ASSE 1061 and shall be installed in accordance with the manufacturer's instructions.		X			Clarification.
RP12-18	**P2909.1 Design.** Drinking water treatment units shall meet the requirements of NSF42, NSF 44, NSF 53, NSF ~~60~~ 62 or CSA B483.1.		X			Creates additional option for water treatment.
RP15-18	**TABLE AG101.1** **PLASTIC PIPING STANDARDS FOR VARIOUS APPLICATIONS[a, b]** **Reason:** This change is to add CSA B137.18 to the various applications in Table AG 101.1. CSA B137.18 is already included in the I Codes and is referenced in Chapter 44 - Reference Standards of the 2018 IRC.		X			Adds CSA B137.18 to the various applications in Table AG 101.1.

APPENDIX F

Table 6. 2021 IBC Changes Cost Impact						
CODE CHANGE #	2021 IBC CHANGE SUMMARY	IBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
G119-18	**VAPOR DIFFUSION PORT.** An assembly constructed or installed within a roof assembly at an opening in the roof deck to convey water vapor from an unvented attic to the outside atmosphere. **1202.3 Unvented attic and unvented enclosed rafter assemblies.** Unvented attics and unvented enclosed roof framing assemblies created by ceilings applied directly to the underside of the roof framing members/rafters and the structural roof sheathing at the top of the roof framing members shall be permitted where all of the following conditions are met: 1. The unvented attic space is completely within the building thermal envelope. 2. No interior Class I vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly or on the ceiling side of the unvented enclosed roof framing assembly. 3. Where wood shingles or shakes are used, not less than a $^1/_4$-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing underlayment above the structural sheathing. 4. In Climate Zones 5, 6, 7 and 8, any air-impermeable insulation shall be a Class II vapor retarder or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation. 5. Insulation shall ~~be located in accordance with the following:~~ comply with either Item 5.1 or 5.2, and additionally Item 5.3 5.1. Item 5.1.1, 5.1.2, 5.1.3 or 5.1.4 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing. 5.1.1. Where only air-impermeable insulation is provided, it shall be applied in direct contact with the underside of the structural roof sheathing. 5.1.2. Where air-permeable insulation is provided inside the building thermal envelope, it shall be installed in accordance with Item 5.1.1. In addition to the air-permeable insulation installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing in accordance with the R-values in Table 1202.3 for condensation control. 5.1.3. Where both air-impermeable and air-permeable insulation are provided, the air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing in accordance with Item 5.1.1 and shall be in accordance with the R-values in Table 1202.3 for condensation control. The air-	X			Minimal	Allows for the use of lower cost alternatives

Table 6. 2021 IBC Changes Cost Impact						
CODE CHANGE #	2021 IBC CHANGE SUMMARY	IBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	permeable insulation shall be installed directly under the air-impermeable insulation. 5.1.4. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45°F (7°C). For calculation purposes, an interior air temperature of 68°F (20°C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months. 5.2. In climate zones 1, 2, and 3 air-permeable insulation installed in unvented attics shall meet the following requirements: 5.2.1. A vapor diffusion port shall be installed not more than 12 inches (305mm) from the highest point of the roof, measured vertically from the highest point of the roof to the lower edge of the port. 5.2.2. The port area shall be ≥ 1:600 of the ceiling area. Where there are multiple ports in the attic, the sum of the port areas shall be greater than or equal to the area requirement. 5.2.3. The vapor permeable membrane in the vapor diffusion port shall have a vapor permeance rating of ≥20 perms when tested in accordance with Procedure A of ASTM E96. 5.2.4. The vapor diffusion port shall serve as an air barrier between the attic and the exterior of the building. 5.2.5. The vapor diffusion port shall protect the attic against the entrance of rain and snow. 5.2.6. Framing members and blocking shall not block the free flow of water vapor to the port. Not less than a 2-inch (50 mm) space shall be provided between any blocking and the roof sheathing. Air-permeable insulation shall be permitted within that space. 5.2.7. The roof slope shall be ≥3:12 (vertical/horizontal). 5.2.8. Where only air-permeable insulation is used, it shall be installed directly below the structural roof sheathing, on top the attic floor, or on top of the ceiling. 5.2.9. Where only air-permeable insulation is used and is installed directly below the structural roof sheathing, air shall be supplied at a flow rate ≥50 CFM (23.6 L/s) per 1000 $ft^2$of ceiling. 5.3. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating.					

Table 6. 2021 IBC Changes Cost Impact						
CODE CHANGE #	2021 IBC CHANGE SUMMARY	IBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating. Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer. **Exceptions:** 1. Section 1202.3 does not apply to special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals or art galleries. 2. Section 1202.3 does not apply to enclosures in Climate Zones 5 through 8 that are humidified beyond 35 percent during the three coldest months.					
G133-18	**[P] 2903** **INSTALLATION OF FIXTURES** **[P] 2903.1 Setting.** Fixtures shall be set level and in proper alignment with reference to adjacent walls. **P] 2903.1.1 Water closets, urinals, lavatories and bidets.** A water closet, urinal, lavatory or bidet shall not be set closer than 15 inches (381 mm) from its center to any side wall, partition, vanity or other obstruction. Where partitions or other obstructions do not separate adjacent fixtures, fixtures shall not be set closer than 30 inches (762 mm) center to center between adjacent fixtures. There shall be not less than a 21-inch (533 mm) clearance in front of a water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall be not less than 30 inches (762 mm) in width **[**and not less than 60 inches (1524 mm) in depth for floor-mounted water closets and not less than 30 inches (762 mm) in width and 56 inches (1422 mm) in depth for wall-hung water closets. **Exception:** An accessible children's water closet shall be set not closer than 12 inches (305 mm) from its center to the required partition or to the wall on one side. **[P] 2903.1.2 Public Lavatories.** In employee and public toilet rooms, the required lavatory shall be located in the same room as the required water closet. **[P] 2903.1.3 Location of fixtures and piping.** Piping, fixtures or equipment shall not be located in such a manner as to interfere with the normal operation of windows, doors or other means of egress openings. **[P] 2903.1.4 Water closet compartment.** Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy. **Exceptions:** 1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.		X			Clarification

Table 6. 2021 IBC Changes Cost Impact						
CODE CHANGE #	2021 IBC CHANGE SUMMARY	IBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	2. Toilet rooms located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment. 3. This provision is not applicable to toilet areas located within Group I-3 housing areas. **[P] 2903.1.5 Urinal Partitions.** Each urinal utilized by the public or employees shall occupy a separate area with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall be not less than 30 inches (762 mm). The walls or partitions shall begin at a height not greater than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater. **Exceptions:** 1. Urinal partitions shall not be required in a single-occupant or family/assisted-use toilet room with a lockable door. 2. Toilet rooms located in child day care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.					
G148-18	**3111.1.1 Wind resistance.** Rooftop-mounted photovoltaic ~~panels and modules~~ (PV) panel systems and solar thermal collectors shall be designed in accordance with Section 1609. **3111.2 Solar thermal systems.** Solar thermal systems shall be designed and installed in accordance with ~~Section 2606.12~~this section, the International Plumbing Code, the International Mechanical Code and the International Fire Code. Where light-transmitting plastic covers are used, solar thermal collectors shall be designed in accordance with Section 2606.12. **3111.3.2 Fire classification.** Rooftop-mounted photovoltaic (PV) panel systems shall have a fire classification in accordance with Section 1505.9. ~~Building-integrated photovoltaic systems~~ BIPV systems installed as the roof covering shall have a fire classification in accordance with Section 1505.8. **3111.3.3 Building-integrated photovoltaic (BIPV) systems.** ~~Building-integrated photovoltaic systems that serve as roof coverings~~ BIPV systems installed as the roof covering shall be designed and installed in accordance with Section ~~1507.18.~~1507.		X			Clarification

APPENDIX G

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
ADM6-19	**Revise 2018 IMC as follows:** **[A] 101.2 Scope.** This code shall regulate the design, installation, maintenance, *alteration* and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. This code shall also regulate those mechanical systems, system components, *equipment* and appliances specifically addressed herein. The installation of fuel gas distribution piping and *equipment*, fuel gas-fired appliances and fuel gas-fired *appliance* venting systems shall be regulated by the International Fuel Gas Code. **Exception:** Detached one- and two-family dwellings and ~~multiple single-family dwellings (~~ townhouses) not more than three stories ~~high~~ above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with this code or the International Residential Code. **Revise 2018 IPC as follows:** **[A] 101.2 Scope.** The provisions of this code shall apply to the erection, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of plumbing systems within this jurisdiction. This code shall regulate nonflammable medical gas, inhalation anesthetic, vacuum piping, nonmedical oxygen systems and sanitary and condensate vacuum collection systems. The installation of fuel gas distribution piping and equipment, fuel-gas-fired water heaters and water heater venting systems shall be regulated by the International Fuel Gas Code. Provisions in the appendices shall not apply unless specifically adopted. **Exception:** Detached one- and two-family dwellings and ~~multiple single-family dwellings (~~ townhouses) not more than three stories ~~high~~ above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with this code or the International Residential Code. **Revise 2018 IBC as follows:** **[A] 101.2 Scope.** The provisions of the this code shall apply to the *repair*, *alteration*, *change of occupancy*, *addition* to and relocation of *existing buildings*. **Exception:** Detached one- and two-family dwellings and ~~multiple single-family *dwellings*~~ (townhouses) not more than three stories above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with this code or the International Residential Code. **Revise 2018 IFGC as follows:**		X			Clarification

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	[A] 101.2 Scope. This code shall apply to the installation of fuel-gas *piping* systems, fuel gas appliances, gaseous hydrogen systems and related accessories in accordance with Sections 101.2.1 through 101.2.5. **Exception:** Detached one- and two-family dwellings and ~~multiple single-family dwellings (~~ townhouses) not more than three stories ~~high~~ above grade plane in height with a separate means of egress, and their accessory structures not more than three stories above grade plane in height, shall comply with this code or the International Residential Code.					
ADM2 5-19	**Revise as follows:** **[A] 105.7.14 High-piled combustible storage.** A construction permit is required for the installation of or modification to a structure ~~exceeding~~ with more than 500 square feet (46 m^2), including aisles, ~~for~~ of high- piled combustible storage. Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit. **105.6.22 High-piled storage.** An operational permit is required to use a building or portion thereof with more than 500 square feet (46 m^2), including aisles, of *high-piled combustible storage*.		X			Clarification
ADM2 7-19	**Revise 2018 IMC as follows:** **SECTION 107** **FEES** **[A] ~~106.5~~ 107.1 ~~Fees.~~ Payment of fees.** A permit shall not be ~~issued~~ valid until the fees prescribed ~~in Section 106.5.2~~ by law have been paid.~~, nor shall an~~ An amendment to a permit shall not be released until the additional fee, if any~~, due to an increase of the mechanical system~~, has been paid. 107.2 **Schedule of permit fees.** Where work requires a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority. **~~[A] 106.5.2 Fee schedule.~~** ~~The fees for mechanical work shall be as indicated in the following schedule.~~ ~~[JURISDICTION TO INSERT APPROPRIATE SCHEDULE]~~ **Permit valuations.** The applicant for a permit shall provide an estimated permit value at time of application. Permit valuations shall include total value of work, including materials and labor, for which the permit is being issued, such as mechanical equipment and permanent systems. If, in the opinion of the code official, the valuation is underestimated on the application, the permit shall be denied, unless the applicant can show detailed estimates to meet the approval of the code official. Final building permit valuation shall be set by the code official. **[A] ~~106.5.1~~ 107.4 Work commencing before permit issuance.** Any person who commences any work on a mechanical system before obtaining the necessary permits shall be subject to ~~100 percent of the usual permit fee~~ a fee established by the code official that shall be in addition to the required permit fees.		X			Correlates all the I-Codes together and makes it easier to understand where the requirements are located.

Table 7. 2021 IEBC Changes Cost Impact							
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	107.5 **Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law. ~~**[A] 106.5.3 Fee refunds.** The code official shall authorize the refunding of fees as follows.~~ ~~1. The full amount of any fee paid hereunder that was erroneously paid or collected.~~ ~~2. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid where work has not been done under a permit issued in accordance with this code.~~ ~~3. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid where an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.~~ ~~The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment.~~ 107.6 **Refunds.** The code official is authorized to establish a refund policy. **Revise 2018 IPC as follows:** **SECTION 107** **FEES** ~~**106.6**~~ **107.1** ~~**Fees.**~~ **Payment of fees.** A permit shall not be ~~issued~~ valid until the fees prescribed ~~in Section 106.6.2~~ by law have been paid.~~, and an~~ An amendment to a permit shall not be released until the additional fee, if any~~, due to an increase of the plumbing systems~~, has been paid. **107.2 Schedule of permit fees.** Where work requires a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority. ~~**106.6.2 Fee schedule.** The fees for all plumbing work shall be as indicated in the following schedule:~~ ~~[JURISDICTION TO INSERT APPROPRIATE SCHEDULE]~~ ~~**106.6.1**~~ **107.4 Work commencing before permit issuance.** Any person who commences any work on a ~~plumbing~~ mechanical system before obtaining the necessary permits shall be subject to ~~100 percent of the usual permit~~ a fee established by the code official that shall be in addition to the required permit fees. **107.5 Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law. ~~106.6.3 **Fee refunds.** The code official shall authorize the refunding of fees as follows:~~					

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~1. The full amount of any fee paid hereunder that was erroneously paid or collected.~~ ~~2. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid where work has been done under a permit issued in accordance with this code.~~ ~~3. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid where an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.~~ ~~The code official shall not authorize the refunding of any fee paid except upon written application filed by the original permittee not later than 180 days after the date of fee payment.~~ **107.6 Refunds.** The code official is authorized to establish a refund policy. **Add new text to 2018 IPMC as follows:** **SECTION 104** **FEES** **[A] ~~103.5~~ 104.1 Fees.** The fees for activities and services performed by the department in carrying out its responsibilities under this code shall be as ~~indicated in the following schedule~~ established by the applicable governing authority. ~~[JURISDICTION TO INSERT APPROPRIATE SCHEDULE.]~~ **104.2 Refunds.** The code official is authorized to establish a refund policy. **Add new text to 2018 IFGC as follows:** **SECTION 107** **FEES** **[A] ~~106.6~~ 107.1 ~~Fees.~~ Payment of fees.** A permit shall not be ~~issued~~ valid until the fees prescribed ~~in Section 106.6.2~~ by law have been paid.~~, nor shall an~~ An amendment to a permit shall not be released until the additional fee, if any~~, due to an increase of the installation~~, has been paid. 107.2 **Schedule of permit fees.** Where work requires a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority. **~~[A] 106.6.2 Fee schedule.~~** ~~The fees for work shall be as indicated in the following schedule.~~ ~~[JURISDICTION TO INSERT APPROPRIATE SCHEDULE]~~ 107.3 **Permit valuations.** The applicant for a permit shall provide an estimated permit value at time of application. Permit valuations shall include total value of work, including materials and labor, for which the permit is being issued, such as plumbing equipment and permanent systems. If, in the opinion of the code official, the valuation is underestimated on the application, the permit shall be denied, unless the applicant can show detailed estimates to meet the approval of the code official. Final building permit valuation shall be set by the code official.					

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	[A] ~~106.6.1~~ 107.4 Work commencing before permit issuance. Any person who commences any work on ~~an installation~~ a mechanical system before obtaining the necessary permits shall be subject to ~~100 percent of the usual permit fee~~ a fee established by the code official that shall be in addition to the required permit fees. 107.5 **Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law. **~~[A] 106.6.3 Fee refunds.~~** ~~The code official shall authorize the refunding of fees as follows.~~ ~~1. The full amount of any fee paid hereunder that was erroneously paid or collected.~~ ~~2. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid where work has not been done under a permit issued in accordance with this code.~~ ~~3. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid where an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.~~ ~~The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment.~~ 107.6 **Refunds.** The code official is authorized to establish a refund policy. **Add new text to 2018 ISPSC as follows:** **SECTION 106 FEES** **[A] ~~105.6~~106.1 ~~Fees.~~ Payment of fees.** A permit shall not be valid until the fees prescribed by law have been paid. An amendment to a permit shall not be released until the additional fee, if any, has been paid. **~~[A] 105.6.2 Fee schedule.~~** ~~The fees for work shall be as indicated in the following schedule:~~ ~~[JURISDICTION TO INSERT APPROPRIATE SCHEDULE]~~ 106.2 **Schedule of permit fees.** Where work requires a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority. 106.3 **Permit valuations.** The applicant for a permit shall provide an estimated permit value at time of application. Permit valuations shall include total value of work, including materials and labor, for which the permit is being issued, such as mechanical equipment and permanent systems. If, in the opinion of the code official, the valuation is underestimated on the application, the permit shall be denied, unless the applicant can show detailed estimates to meet the approval of the code official. Final building permit valuation shall be set by the code official.					

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	[A] ~~105.6.1~~ 106.4 Work commencing before permit issuance. Any person who commences any work on a mechanical system before obtaining the necessary permits shall be subject to a fee ~~as indicated in the adopted fee schedule and would~~ established by the code official that shall be in addition to the required permit fees. **106.5 Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law. **~~[A] 105.6.3 Fee refunds.~~** ~~The code official shall authorize the refunding of fees as follows:~~ ~~1. The full amount of any fee paid hereunder that was erroneously paid or collected.~~ ~~2. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work has been done under a permit issued in accordance with this code.~~ ~~3. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.~~ ~~The code official shall not authorize the refunding of any fee paid except upon written application filed by the original permittee not later than 180 days after the date of fee payment.~~ **106.6 Refunds.** The code official is authorized to establish a refund policy.					
ADM3 1-19 Part I	**Add new text to 2018 IPC as follows:** **SECTION 108** **NOTICE OF APPROVAL** **~~107.5~~ 108.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. **~~107.5.1~~ 108.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code. **Add new text to 2018 IMC as follows:** **SECTION 108** **NOTICE OF APPROVAL** **[A] ~~107.4~~ 108.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. **[A] ~~107.4.1~~ 108.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, on the basis of incorrect information		X			Provides consistency through the I- Codes by using standard terminology and it is also consistent with previous actions.

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code. **Add new text to 2018 IFGC as follows:** **SECTION 108** **NOTICE OF APPROVAL** **[A] ~~107.4~~ 108.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. **[A] ~~107.4.1~~ 108.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, or on the basis of incorrect information supplied or where it is determined that the building or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code. **2018 International Swimming Pool and Spa Code** **Add new text to 2018 ISPSC as follows:** **SECTION 107** **NOTICE OF APPROVAL** **[A] ~~106.17~~ 107.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. **[A] ~~106.17.1~~ 107.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, or on the basis of the incorrect information supplied, or where it is determined that the building or structure, premise, system or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code. **Add new text to 2018 International Private Sewage Disposal Code as follows:** **SECTION 108** **NOTICE OF APPROVAL** **[A] ~~107.7~~ 108.1 Approval.** After the prescribed inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. **[A] ~~107.7.1~~ 108.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.					

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
ADM3 1-19 Part II	**Add new text to 2018 IPC as follows:** **SECTION 108** **NOTICE OF APPROVAL** ~~**107.5**~~ **108.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. ~~**107.5.1**~~ **108.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code. **Add new text to 2018 IMC as follows:** **SECTION 108** **NOTICE OF APPROVAL** **[A]** ~~**107.4**~~ **108.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. **[A]** ~~**107.4.1**~~ **108.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code. **Add new text to 2018 IFGC as follows:** **SECTION 108** **NOTICE OF APPROVAL** **[A]** ~~**107.4**~~ **108.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. **[A]** ~~**107.4.1**~~ **108.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, or on the basis of incorrect information supplied or where it is determined that the building or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code. **Add new text to 2018 ISPSC as follows:** **SECTION 107** **NOTICE OF APPROVAL** **[A]** ~~**106.17**~~ **107.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. **[A]** ~~**106.17.1**~~ **107.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code		X			Provides consistency through the I- Codes by using standard terminology and it is also consistent with previous actions.

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	wherever the notice is issued in error, or on the basis of the incorrect information supplied, or where it is determined that the building or structure, premise, system or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code. **Add new text to 2018 International Private Sewage Disposal Code as follows:** **SECTION 108** **NOTICE OF APPROVAL** **[A] ~~107.7~~ 108.1 Approval.** After the prescribed inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code official. **[A] ~~107.7.1~~ 108.2 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.					
ADM3 1-19 Part III	**Add new text to 2018 IECC as follows:** **SECTION R106** **NOTICE OF APPROVAL** **~~R105.7~~ R106.1 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the *code official*. **~~R105.7.1~~ R106.2 Revocation.** The *code official* is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the *building* or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.		X			Clarification
ADM3 9-19 Part I	**Modify as 2018 IBC as follows:** **[A] 112.2 Temporary connection.** The building official shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or ~~power~~ sewer system for the purpose of testing systems or for use under a temporary approval. **Modify as 2018 IPC as follows:** **108.2 Temporary connection.** The code official shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or ~~power~~ sewer system for the purpose of testing plumbing systems or for use under a temporary approval. **Modify as 2018 IMC as follows:** **[A] 108.2 Temporary connection.** The code official shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or ~~power~~ sewer system for the purpose of testing systems or for use under a temporary approval. **Modify as 2018 IFGC as follows:** **[A] 108.2 Temporary connection.** The code official shall have the authority to		X			Clarification

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or ~~power~~ sewer system for the purpose of testing systems or for use under a temporary approval. **Modify as 2018 IEBC as follows:** **[A] 111.2 Temporary connection.** The *code official* shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power water system or ~~power~~ sewer system for the purpose of testing systems or for use under a temporary approval. **Modify as 2018 International Private Sewage Disposal Code as follows:** **[A] 108.2 Temporary connection.** The code official shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or ~~power~~ sewer system for the purpose of testing systems or for use under a temporary approval. **Modify 2018 International Wildland-Urban Interface Code as follows:** **113.2 Temporary connection.** The code official shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or ~~power~~ sewer system for the purpose of testing systems or for use under a temporary approval. **Modify as 2018 ISPSC as follows:** **[A] 107.2 Temporary connection.** The code official shall have the authority to authorize the temporary connection of the building or system to the utility, source of energy, fuel, power, water system or ~~power~~ sewer system for the purpose of testing systems or for use under a temporary approval.					
ADM4 6-19 Part I	**Modify as 2018 IEBC as follows:** **[A] 107.1 General.** Submittal documents consisting of *construction documents*, statement of *special inspections*, geotechnical report and other data shall be submitted in two or more sets, or in a digital format where allowed by the building official, with each *permit* application. The *construction documents* shall be prepared by a *registered design professional* where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *building official* is authorized to require additional *construction documents* to be prepared by a *registered design professional*. **Exception:** The *building official* is authorized to waive the submission of *construction documents* and other data not required to be prepared by a *registered design professional* if it is found that the nature of the work applied for is such that review of *construction documents* is not necessary to obtain compliance with this code. **Modify as 2018 IFC as follows:** **[A] 105.4.2 Information on construction documents.** *Construction documents* shall be drawn to scale on suitable material. ~~Electronic media documents~~ Documents in a digital format are allowed to be submitted where *approved* by the *fire code official*. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations as determined by the *fire code official*. **Modify as 2018 IEBC as follows:**		X			Clarification

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	[A] 106.1 General. Submittal documents consisting of construction documents, special inspection and structural observation programs, investigation and evaluation reports, and other data shall be submitted in two or more sets, or in a digital format where allowed by the building official, with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require additional construction documents to be prepared by a registered design professional. **Exception:** The *code official* is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that reviewing of construction documents is not necessary to obtain compliance with this code. **Modify as 2018 IEPC as follows:** **[A] 106.3.1 Construction documents.** Construction documents, engineering calculations, diagrams and other such data shall be submitted in two or more sets, or in a digital format where allowed by the building official, with each application for a permit. The code official shall require construction documents, computations and specifications to be prepared and designed by a registered design professional where required by state law. Construction documents shall be drawn to scale and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that the work conforms to the provisions of this code. Construction documents for buildings more than two stories in height shall indicate where penetrations will be made for pipes, fittings and components and shall indicate the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking. **Exception:** The code official shall have the authority to waive the submission of construction documents, calculations or other data if the nature of the work applied for is such that reviewing of construction documents is not necessary to determine compliance with this code. **Modify as 2018 IMC as follows:** **[A] 106.3.1 Construction documents.** *Construction documents*, engineering calculations, diagrams and other data shall be submitted in two or more sets, or in a digital format where allowed by the building official, with each application for a permit. The code official shall require *construction documents*, computations and specifications to be prepared and designed by a *registered design professional* where required by state law. Where special conditions exist, the code official is authorized to require additional *construction documents* to be prepared by a *registered design professional*. *Construction documents* shall be drawn to scale and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that the work conforms to the provisions of this					

Table 7. 2021 IEBC Changes Cost Impact						
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		Decrease	None	Increase		
Sub Code:						
	code. *Construction documents* for buildings more than two stories in height shall indicate where penetrations will be made for mechanical systems, and the materials and methods for maintaining required structural safety, fire- resistance rating and fireblocking. **Exception:** The code official shall have the authority to waive the submission of *construction documents*, calculations or other data if the nature of the work applied for is such that reviewing of *construction documents* is not necessary to determine compliance with this code. **Modify as 2018 IFGC as follows:** **[A] 106.3.1 Construction documents.** *Construction documents*, engineering calculations, diagrams and other data shall be submitted in two or more sets, or in a digital format where allowed by the building official, with each application for a permit. The code official shall require *construction documents*, computations and specifications to be prepared and designed by a registered design professional where required by state law. *Construction documents* shall be drawn to scale and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that the work conforms to the provisions of this code. *Construction documents* for buildings more than two stories in height shall indicate where penetrations will be made for installations and shall indicate the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking. **Exception:** The code official shall have the authority to waive the submission of *construction documents*, calculations or other data if the nature of the work applied for is such that reviewing of *construction documents* is not necessary to determine compliance with this code. **Modify as 2018 ISPSC as follows:** **A] 105.3 Construction documents.** Construction documents, engineering calculations, diagrams and other such data shall be submitted in two or more sets, or in a digital format where allowed by the building official, with each application for a permit. The code official shall require construction documents, computations and specifications to be prepared and designed by a registered design professional where required by state law. Construction documents shall be drawn to scale and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that the work conforms to the provisions of this code. **Modify 2018 International Private Sewage Disposal Code as follows:** **[A] 106.2.1 Construction documents.** An application for a permit shall be accompanied by not less than two copies of construction documents drawn to scale, or in a digital format where allowed by the building official, with sufficient clarity and detail dimensions showing the nature and character of the work to be performed. Specifications shall include pumps and controls, dose volume, elevation differences (vertical lift), pipe friction loss, pump performance curve,					

Table 7. 2021 IEBC Changes Cost Impact

CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	Sub Code:					
	pump model and pump manufacturer. The code official is permitted to waive the requirements for filing construction documents where the work involved is of a minor nature. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality, and this code shall not be cited, or the term "legal" or its equivalent used as a substitute for specific information. **Modify 2018 International Wildland-Urban Interface Code as follows:** **[A] 108.1 General.** Plans, engineering calculations, diagrams and other data shall be submitted in not fewer than two sets, or in a digital format where allowed by the building official, with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the code official is authorized to require additional documents to be prepared by a registered design professional. **Exception:** Submission of plans, calculations, construction inspection requirements and other data, if it is found that the nature of the work applied for is such that reviewing of plans is not necessary to obtain compliance with this code.					
ADM4 7-16	**Modify as follows:** **ASTM** / **ASTM** **Standard Reference Number** / **Title** / **Referenced in Code(s):** E136—~~2016A~~ 2019 / Standard Test Method for Assessing Combustibility of ~~Behavior of~~ Materials Using ~~in~~ a Vertical Tube Furnace at 750°C / IBC **NSF** / **NSF** **Standard Reference Number** / **Title** / **Referenced in Code(s):** 61--2017 61--2018 / Drinking Water System Components—Health Effects / IRC IPC **SMACNA** / **SMACNA** **Standard Reference Number** / **Title** / **Referenced in Code(s):**		X			Clarification

Table 7. 2021 IEBC Changes Cost Impact

CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	ANSI/SMACNA-~~1999~~ 2013 — Standard Specification for Composite Steel Joists, CJ-Series — IMC ANSI/SMACNA-~~2004~~ 2011 — Rectangular Industrial Duct Construction Standards — IMC					
EB8-19	**[Accessibility – does not apply to Florida]** **Modify as follows:** **SECTION 301** **ADMINISTRATION** **~~301.5 Compliance with accessibility.~~** ~~Accessibility requirements for *existing buildings* shall comply with the 2009 edition of ICC A117.1.~~ **SECTION 305** **ACCESSIBILITY FOR EXISTING BUILDINGS** **305.1 Scope.** The provisions of Sections 305.1 through 305.9 apply to maintenance, *change of occupancy*, *additions* and *alterations* to *existing buildings*, including those identified as *historic buildings*. **305.2 Design.** Buildings and facilities shall be designed and constructed to be *accessible* in accordance with this code and the alteration and existing building provisions in ICC A117.1, as applicable. **305.8.2 Elevators.** Altered elements of existing elevators shall comply with ASME A17.1 ~~and ICC A117.1~~. Such elements shall also be altered in elevators programmed to respond to the same hall call control as the altered elevator. **305.8.3 Platform lifts.** Platform (wheelchair) lifts ~~complying with ICC A117.1 and~~ installed in accordance with ASME A18.1 shall be permitted as a component of an accessible route.		X			Makes reference to A117.1 more consistent with how standards are referenced within the I-Codes.
EB32-19	**[Accessibility – does not apply to Florida]** **Revise as follows:** **305.8.10 Toilet rooms.** Where it is *technically infeasible* to alter existing toilet ~~and bathing~~ rooms to be *accessible,* ~~an *accessible*~~ one accessible single user toilet room or one *accessible* family or assisted-use toilet ~~or bathing~~ room constructed in accordance with Section 1109.2.1 of the International Building Code is permitted. ~~The family or assisted-use toilet or bathing~~ This toilet room shall be located on the same floor and in the same area as the existing toilet ~~or bathing~~ rooms. At the inaccessible toilet ~~and bathing~~ rooms, directional signs indicating the location of the nearest ~~family or assisted-use~~ such toilet room ~~or bathing~~ room shall be provided. These directional signs shall include the International Symbol of Accessibility and sign characters shall meet the visual character requirements in accordance with ICC A117.1. **305.8.11 Bathing rooms.** Where it is *technically infeasible* to alter existing bathing rooms to be *accessible*, one *accessible* single user bathing room or one accessible family or assisted-use bathing room constructed in accordance with Section 1109.2.1 of the *International Building Code* is permitted. This accessible bathing room shall be located on the same floor and in the same area as the existing bathing rooms. At the inaccessible bathing rooms, directional signs		X			Clarification

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	indicating the location of the nearest such bathing room shall be provided. These directional signs shall include the International Symbol of Accessibility and sign characters shall meet the visual character requirements in accordance with ICC A117.1. **305.9.4 Toilet ~~and bathing~~ facilities.** Where toilet rooms are provided, not fewer than one accessible single user toilet room or one accessible family or assisted-use toilet room complying with Section 1109.2.1 of the International Building Code shall be provided. **305.9.5 Bathing facilities.** Where bathing rooms are provided, not fewer than one accessible single user bathing room or one *accessible* family or assisted-use bathing rooms complying with Section 1109.2.1 of the *International Building Code* shall be provided.					
EB37-19	**[Accessibility – does not apply to Florida]** **305.9 Historic ~~buildings~~ structures.** ~~These provisions shall apply to *facilities* designated as historic structures that undergo *alterations* or a *change of occupancy*, unless *technically infeasible*.~~ Where compliance with the requirements for accessible routes, entrances or toilet rooms would threaten or destroy the historic significance of the ~~*facility*~~ historic structure, as determined by the authority having jurisdiction, the alternative requirements of Sections 305.9.1 through 305.9.4 for that element shall be permitted. ~~**Exception:**~~ ~~Type B dwelling or sleeping units required by Section 1107 of the International Building Code are not required to be provided in historic buildings.~~ **305.9.1 Site arrival points.** Not fewer than one accessible route from a site arrival point to an accessible entrance shall be provided. **305.9.2 Multiple-level buildings and facilities.** An accessible route from an accessible entrance to public spaces on the level of the accessible entrance shall be provided. **305.9.3 Entrances.** ~~Not fewer than one main entrance shall be accessible.~~ ~~**Exception:**~~ ~~If a public~~ Where an entrance cannot be made accessible in accordance with Section 305.8.1, an accessible entrance that is unlocked while the building is occupied shall be provided; or, a locked accessible entrance with a notification system or remote monitoring shall be provided. Signs complying with Section 1111 of the International Building Code shall be provided at the public ~~entrance~~ entrances and the accessible entrance. **305.9.4 Toilet and bathing facilities.** Where toilet rooms are provided, not fewer than one accessible family or assisted-use toilet room complying with Section 1109.2.1 of the International Building Code shall be provided. **305.9.5 Type B units.** Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in historic buildings.		X			Clarifies that historic buildings need to comply with accessibility requirements where technically feasible

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		Decrease	None	Increase		
Sub Code:						
EB40-19	**Modify as follows:** **306.1 Smoke Alarms.** Where an alteration, addition, change of occupancy or relocation of a building is made to an existing building or structure of a Group R and I-1 occupancies, the existing building shall be provided with smoke alarms in accordance with Section 1103.8 of the International Fire Coed or Section R314 of the International Residential Code. **Exception:** Work classified as Level 1 Alterations in accordance with Chapter 7. **307.1 Carbon monoxide detection.** Where an addition, alteration, change of occupancy or relocation of a building is made to Group I-1, I-2, I-4 and R occupancies and classrooms of Group E occupancies, the existing building shall be provided with carbon monoxide detection in accordance with Section 1103.9 of the International Fire Code or Section R315 of the International Residential Code. **Exceptions:** 1. Work involving the exterior surfaces of buildings, such as the replacement of roofing or siding, the addition or r eplacement of windows or doors, or the addition of porches or decks. 2. Installation, alteration or repairs of plumbing or mechanical systems, other than fuel-burning appliances. 3. Work classified as Level 1 Alterations in accordance with Chapter 7.	X			Minimal	Clarification: Less stringent requirement for alteration serves the same purpose
EB46-19	~~**406.1.4 Group I-2 receptacles.** Receptacles in patient bed locations of Group I-2 that are not "hospital grade" shall be replaced with "hospital grade" receptacles, as required by NFPA 99 and Article 517 of NFPA 70.~~ **406.1.4 Healthcare facilities.** Portions of electrical systems being repaired in Group I-2, ambulatory care facilities and outpatient clinics shall comply with NFPA 99 requirements for repairs. **408.3 Healthcare facilities.** Portions of Medical Gas systems being repaired in Group I-2, ambulatory care facilities and outpatient clinics shall comply with NFPA 99 requirements for repairs.		X			Necessary to link with the required regulations for healthcare occupancies which require compliance with NFPA 99 for repairs of electrical and medical gas systems.
EB49-19	**501.3 Healthcare facilities.** In Group I-2 facilities, ambulatory care facilities and outpatient clinics, any altered or added portion of an existing electrical or medical gas systems shall be required to meet installation and equipment requirements in NFPA 99. **SECTION 706** **ELECTRICAL** **706.1 Healthcare facilities.** In Group I-2 facilities, ambulatory care facilities and outpatient clinics, any altered, portion of an existing electrical systems shall be required to meet installation and equipment requirements in NFPA 99		X			Necessary addition for clarification

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CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	807.3 Healthcare facilities. In Group I-2 facilities, ambulatory care facilities and outpatient clinics, any added portion of an existing electrical systems shall be required to meet installation and equipment requirements in NFPA 99. **809.2 Healthcare facilities.** In Group I-2 facilities, ambulatory care facilities and outpatient clinics, any added portion of an existing medical gas systems shall be required to meet installation and equipment requirements in NFPA 99.					
EB92-19	~~**SECTION 809**~~ ~~**PLUMBING**~~ ~~**809.1 Minimum fixtures.** Where the occupant load of the story is increased by more than 20 percent, plumbing fixtures for the story shall be provided in quantities specified in the International Plumbing Code based on the increased occupant load.~~ **1009.1 Increased demand.** Where the occupancy of an *existing building* or part of an *existing building* is changed such that the new occupancy is subject to increased or different plumbing fixture requirements or to increased water supply requirements in accordance with the International Plumbing Code, the new occupancy shall comply with the intent of the respective International Plumbing Code provisions. **Exception:** Only where the occupant load of the story is increased by more than 20 percent, plumbing fixtures for the story shall be provided in quantities specified in the International Plumbing Code based on the increased occupant load.	X			Minimal	Removes an unnecessary definition.
EB94-19	**Modify as follows:** **SECTION 905** **MEANS OF EGRESS** **905.1 General.** The means of egress shall comply with the requirements of Section 805 except as specifically required in Sections 905.2 and 905.3. **905.2 Means-of-egress lighting.** Means of egress from the highest *work area* floor to the floor of exit discharge shall be provided with artificial lighting within the exit enclosure in accordance with the requirements of the International Building Code. **905.3 Exit signs.** Means of egress from the highest *work area* floor to the floor of exit discharge shall be provided with exit signs in accordance with the requirements of the International Building Code. **905.4 Two-way communications systems.** In buildings with elevator service , a two way communication systems shall be provided where required by in accordance with Section 1009.8 of the International Building Code. **SECTION 503** **ALTERATIONS** **503.17 Two-way communications systems.** Where the work area for alterations exceeds 50 percent of the building area and the building has elevator service, a two way communication systems shall be provided where required by in accordance with Section 1009.8 of the International Building Code.	-		X	$2.00 per Sqft. of surface area	Clarification
G32-18	**Modify as follows:**	X			Minimal	Clarification

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CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	404.5 Smoke control. A smoke control system shall be installed in accordance with Section 909. **Exceptions:** 1. In other than Group I-2, and Group I-1, Condition 2, smoke control is not required for atriums that connect only two stories. 2. A smoke control system is not required for atriums connecting more than two stories when all of the following are met: 2.1. Only the 2 lowest stories shall be permitted to be open to the atrium 2.2. All stories above the lowest 2 stories shall be separated from the atrium in accordance with ~~Section 404.6~~ the provision for a shaft in Section 713.4.					
G39-18	**Modify as follows:** **SECTION 202** **DEFINITIONS** **202 MECHANICAL-ACCESS ENCLOSED PARKING GARAGE.** An enclosed parking garage ~~other than single-car stacking systems~~, which employs parking machines, lifts, elevators or other mechanical devices for vehicle moving from and to street level and in which public occupancy in the garage is prohibited in all areas except the vehicle access bay. **406.6.4 Mechanical-access garages.** Mechanical-access enclosed parking garages shall be in accordance with Sections 406.6.4.1 through 406.6.4.5. **406.6.4.1 Separation.** Mechanical-access enclosed parking garages shall be separated from other occupancies and accessory uses by not less than 2-hour fire barriers constructed in accordance with Section 707 or by not less than 2-hour horizontal assemblies constructed in accordance with Section 711, or both. **406.6.4.2 Smoke removal.** A mechanical smoke removal system, in accordance with Section 910.4, shall be provided for all areas containing an ~~enclosed~~ mechanical-access ~~parking~~ enclosed parking garage. **406.6.4.3 Fire control equipment room.** The fire control equipment, consisting of the fire alarm control unit, mechanical ventilation controls and emergency shut down switch shall be provided in a room ~~with exterior access~~ located where the equipment is able to be accessed by the fire service from a secured exterior door of the building. The room shall be a minimum of 50 square feet in size and location shall be in a location that is approved by the fire code official. **406.6.4.4 ~~Firefighter~~ Fire department access doors.** Access doors shall be provided ~~at the ground level for firefighter access as approved by the fire code official~~ in accordance with Section 3206.7. **406.6.4.5 3.1 Emergency shutdown switch.** ~~A~~ The mechanical parking system shall be provided with a manually activated emergency shutdown switch ~~shall be provided~~ for use by emergency personnel. The switch shall be clearly identified and shall be in a location approved by the fire code official. **Modify 2018 International Fire Code as follows:** **SECTION 202**	X			Minimal	Clarification Also note the added control room and shutdown switch requirement

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		Decrease	None	Increase		
Sub Code:						
	GENERAL DEFINITIONS **MECHANICAL-ACCESS ENCLOSED PARKING GARAGE.** An enclosed parking garage, ~~other than single car stacking system,~~ which employs parking machines, lifts, elevators or other mechanical devices for vehicle moving from and to street level and in which public occupancy in the garage is prohibited in all areas except the vehicle access bay. **903.2.10.2 Mechanical-access enclosed parking garages.** An approved automatic sprinkler system shall be provided throughout buildings used for the storage of motor vehicles in a mechanical-access enclosed parking garage. The portion of the building that contains the mechanical-access enclosed parking garage shall be protected with a ~~performance-based design~~ specially engineered automatic sprinkler system.				-	
G40-18	**Modify as follows:** **407.2.5 Nursing home housing units.** In Group I-2, Condition 1 occupancies, in areas where nursing home residents are housed, shared living spaces, group meeting or multipurpose therapeutic spaces shall be permitted to be open to the corridor, where all of the following criteria are met: 1. The walls and ceilings of the space are constructed as required for corridors. 2. The spaces are not occupied as resident sleeping rooms, treatment rooms, incidental uses in accordance with Section 509, or hazardous uses. 3. The open space is protected by an automatic fire detection system installed in accordance with Section 907. 4. The corridors onto which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system installed in accordance with Section 907, or the smoke compartment in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2. 5. The space is arranged so as not to obstruct access to the required exits. **407.2.6 Nursing home cooking facilities.** In Group I-2, Condition 1 occupancies, rooms or spaces that contain a cooking facility with domestic cooking appliances shall be permitted to be open to the corridor where all of the following criteria are met: 1. The number of care recipients housed in the smoke compartment shall not be greater than 30. 2. The number of care recipients served by the cooking facility shall not be greater than 30. 3. Not more than one cooking facility area shall be permitted in a smoke compartment. 4. ~~The types of domestic cooking appliances permitted shall be limited to ovens, cooktops, ranges, warmers and microwaves.~~ ~~5~~4. The corridor shall be a clearly identified space delineated by construction or floor pattern, material or color. ~~6~~5. The space containing the domestic cooking facility shall be arranged so as not to obstruct access to the required exit.		X			Makes the provisions easier to enforce and bring the IBC closer to the CMS requirements.

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		Decrease	None	Increase		
Sub Code:						
	~~7~~6. ~~Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Codeshall be provided over cooktops and ranges.~~ The cooking appliance shall comply with Section 407.2.7. ~~8. Cooktops and ranges shall be protected in accordance with Section 904.13.~~ ~~9. A shut-off for the fuel and electrical power supply to the cooking equipment shall be provided in a location that is accessible only to staff.~~ ~~10. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes.~~ ~~11. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906, and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance.~~ **407.2.7 Domestic cooking appliances.** In Group I-2 occupancies, installation of cooking appliances used in domestic cooking facilities shall comply with all of the following: 1. The types of cooking appliances permitted shall be limited to ovens, cooktops, ranges, warmers and microwaves. 2. Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Code shall be provided over cooktops and ranges. 3. Cooktops and ranges shall be protected in accordance with Section 904.13. 4. A shut-off for the fuel and electrical power supply to the cooking equipment shall be provided in a location that is accessible only to staff. 5. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes. 6. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906, and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance. **Modify 2018 International Fire Cod as follows:** **904.13 Domestic cooking ~~systems~~ facilities.** Cooktops and ranges installed in the following occupancies shall be protected in accordance with Section 904.13.1: 1. In Group I-1 occupancies where domestic cooking facilities are installed in accordance with Section 420.8 of the International Building Code. 2. In Group I-2 ~~, Condition 1~~ occupancies where domestic cooking facilities are installed in accordance with Section ~~407.2.6~~ 407.2.7 of the International Building Code. 3. In Group R-2 college dormitories where domestic cooking facilities are installed in accordance with Section 420.10 of the International Building Code.					
G41-18	**Revise as follows:** **407.2.6 Nursing home cooking facilities.** In Group I-2, Condition 1 occupancies, rooms or spaces that contain a cooking facility with domestic cooking appliances shall be permitted to be open to the corridor where all of the following criteria		X			Clarification

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CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	are met: 1. The number of care recipients housed in the smoke compartment shall not be greater than 30. 2. The number of care recipients served by the cooking facility shall not be greater than 30. 3. Not more than one cooking facility area shall be permitted in a smoke compartment. 4. The types of domestic cooking appliances permitted shall be limited to ovens, cooktops, ranges, warmers and microwaves. 5. The corridor shall be a clearly identified space delineated by construction or floor pattern, material or color. 6. The space containing the domestic cooking facility shall be arranged so as not to obstruct access to the required exit. 7. Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Codeshall be provided over cooktops and ranges. 8. Cooktops and ranges shall be protected in accordance with Section 904.13. 9. A shut-off for the fuel and electrical power supply to the cooking equipment shall be provided in a location that is accessible only to staff. 10. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes. 11. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906, and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance. **Exceptions:** 1. Cooktops and ranges located within smoke compartments with no patient sleeping or patient care areas are not required to comply with this section. 2. Cooktops and ranges used for care recipient training or nutritional counseling are not required to comply with Item 8 of this section.					
G49-18	**Modify as follows:** **415.6.1 ~~Liquid use, dispensing and mixing rooms and r~~Rooms for flammable or combustible liquid use, dispensing or mixing in open systems.** ~~Liquid use, dispensing and mixing rooms and r~~Rooms for flammable or combustible liquid use, dispensing or mixing in open systems, where vapors are emitted, having a floor area of not more than 500 square feet (46.5 m^2) need not be located on the outer perimeter of the building where they are in accordance with the International Fire Code and NFPA 30. **415.6.2 Liquid storage rooms and rooms for flammable or combustible liquid use in closed systems.** Liquid storage rooms and rooms for flammable or combustible liquid use in closed systems~~, where no vapors are emitted~~, having a floor area of not more than 1,000 square feet (93 m^2) need not be located on		X			Clarification

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CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	the outer perimeter where they are in accordance with the International Fire Code and NFPA 30. **507.8.1.1.1 ~~Liquid use, dispensing and mixing rooms and r~~Rooms for flammable or combustible liquid use, dispensing or mixing in open systems.** ~~Liquid use, dispensing and mixing rooms and r~~Rooms for flammable or combustible liquid use, dispensing or mixing in open systems~~, where vapors are emitted, and~~ having a floor area of not more than 500 square feet (46.5 m^2) need not be located on the outer perimeter of the building where they are in accordance with the International Fire Code and NFPA 30. **507.8.1.1.2 Liquid storage rooms and rooms for flammable or combustible liquid use in closed systems.** Liquid storage rooms and rooms for flammable or combustible liquid use in closed systems~~, where no vapors are emitted~~, having a floor area of not more than 1,000 square feet (93 m^2) need not be located on the outer perimeter where they are in accordance with the International Fire Code and NFPA 30.					
G52-18	**[F] ~~415.11.3.5~~415.11.4 Emergency alarm system.** Emergency alarm systems shall be provided in accordance with this section and Sections 415.5.1 and ~~415.5.2.~~ 415.5.2. The maximum allowable quantity per control area provisions shall not apply to emergency alarm systems required for HPM. **[F] ~~415.11.3.5.1~~ 415.11.4.1 Service corridors.** An emergency alarm system shall be provided in service corridors, with not fewer than one alarm device in each service corridor. **[F] ~~415.11.3.5.2~~ 415.11.4.2 Corridors and interior exit stairways and ramps.** Emergency alarms for corridors, interior exit stairways and ramps and exit passageways shall comply with Section ~~415.5.2.~~ 415.5.2. **[F] ~~415.11.3.5.3~~ 415.11.4.3 Liquid storage rooms, HPM rooms and gas rooms.** Emergency alarms for liquid storage rooms, HPM rooms and gas rooms shall comply with Section ~~415.5.1.~~415.5.1. **[F] ~~415.11.3.5.4~~ 415.11.4.4 Alarm-initiating devices.** An approved emergency telephone system, local alarm manual pull stations, or other approved alarm-initiating devices are allowed to be used as emergency alarm-initiating devices. **[F] ~~415.11.3.5.5~~ 415.11.4.5 Alarm signals.** Activation of the emergency alarm system shall sound a local alarm and transmit a signal to the emergency control station.		X			Clarification
G55-18	**Revise as follows:** **420.7 Group I-1 assisted living housing units.** In Group I-1 occupancies, where a fire-resistance corridor is provided in areas where assisted living residents are housed, shared living spaces, group meeting or multipurpose therapeutic spaces open to the corridor shall be in accordance with all of the following criteria: 1. The walls and ceilings of the space are constructed as required for corridors. 2. The spaces are not occupied as resident sleeping rooms, treatment rooms, incidental uses in accordance with Section 509, or hazardous uses. 3. The open space is protected by an automatic fire detection system installed		X			Provides consistency with similar provisions addressing Group I-2 occupancies and provides more

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		Decrease	None	Increase		
Sub Code:						
	in accordance with Section 907. 4. In Group I-1, Condition 1, the corridors onto which the spaces open are protected by an automatic fire detection system installed in accordance with Section 907, or the spaces are equipped throughout with quick-response sprinklers in accordance with Section 903.3.2. 5. In Group I-1, Condition 2, the corridors onto which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system installed in accordance with Section 907, or the smoke compartment in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2. 6. The space is arranged so as not to obstruct access to the required exits. **420.8 Group I-1 cooking facilities.** In Group I-1 occupancies, rooms or spaces that contain a cooking ~~facilities~~ facility with domestic cooking appliances shall ~~be in accordance with~~ be permitted to be open to the corridor where all of the following criteria are met: 1. In Group I-1, Condition 1 occupancies, the number of care recipients served by one cooking facility shall not be greater than 30. 2. In Group I-1, Condition 2 occupancies, the number of care recipients served by one cooking facility and within the same smoke compartment shall not be greater than 30. 3. ~~The types of domestic cooking appliances permitted shall be limited to ovens, cooktops, ranges, warmers and microwaves.~~ ~~4~~3. The space containing the ~~domestic~~ cooking facilities shall be arranged so as not to obstruct access to the required exit. ~~5~~4. ~~Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Code shall be provided over cooktops or ranges.~~ The cooking appliances shall comply with Section 420.9. ~~6. Cooktops and ranges shall be protected in accordance with Section 904.13.~~ ~~7. A shutoff for the fuel and electrical supply to the cooking equipment shall be provided in a location that is accessible only to staff.~~ ~~8. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes.~~ ~~9. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906 and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance.~~ ~~**420.8.1 Cooking facilities open to the corridor.** Cooking facilities located in a room or space open to a corridor, aisle or common space shall comply with Section 420.8.~~ 420.9 **Domestic cooking appliances.** In Group I-1 occupancies, installation of cooking appliance used in domestic cooking facilities shall comply with all of the following: 1. The types of cooking appliances permitted shall be limited to ovens,					consistency with federal standards.

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CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	cooktops, ranges, warmers and microwaves. 2. Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Code shall be provided over cooktops or ranges. 3. Cooktops and ranges shall be protected in accordance with Section 904.13. 4. A shutoff for the fuel and electrical supply to the cooking equipment shall be provided in a location that is accessible only to staff. 5. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes. 6. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906 and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance. **Revise 2018 International Fire Cod e as follows:** **904.13 Domestic cooking ~~systems.~~ facilities.** Cooktops and ranges installed in the following occupancies shall be protected in accordance with Section 904.13.1: 1. In Group I-1 occupancies where domestic cooking facilities are installed in accordance with Section ~~420.8~~ 420.9 of the International Building Code. 2. In Group I-2, Condition 1 occupancies where domestic cooking facilities are installed in accordance with Section 407.2.6 of the International Building Code. 3. In Group R-2 college dormitories where domestic cooking facilities are installed in accordance with Section 420.10 of the International Building Code.					
G58-18	**Revise as follows:** **422.1 General.** Occupancies classified as *ambulatory care facilities* shall comply with the provisions of Sections 422.1 through ~~422.6~~ 422.7 and other applicable provisions of this code. **422.7 Domestic cooking.** Installation of cooking appliances used in domestic cooking facilities shall comply with all of the following: 1. The types of cooking appliances permitted are limited to ovens, cooktops, ranges, warmers and microwaves 2. Domestic cooking hoods installed and constructed in accordance with Section 505 of the International Mechanical Code shall be provided over cooktops or ranges. 3. A shutoff for the fuel and electrical supply to the cooking equipment shall be provided in a location that is accessible only to staff. 4. A timer shall be provided that automatically deactivates the cooking appliances within a period of not more than 120 minutes. 5. A portable fire extinguisher shall be provided. Installation shall be in accordance with Section 906 and the extinguisher shall be located within a 30-foot (9144 mm) distance of travel from each domestic cooking appliance.			X	Minimal	Updated based federal health care standards
G59-18	**Revise as follows:** **423.1 General.** This section applies to the construction of storm shelters		X			Improves the

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CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	constructed as separate detached buildings or constructed as rooms or spaces within buildings for the purpose of providing protection from storms that produce high winds, such as tornadoes and hurricanes during the storm. ~~Such structures shall be designated to be hurricane shelters, tornado shelters, or combined hurricane and tornado~~ This section specifies where storm shelters are required and provides requirements for the design and construction of storm shelters. Design of facilities for use as emergency shelters after the storm are outside the scope of ICC 500 and shall comply with Table 1604.5 as a Risk Category IV Structure. **423.2 Construction.** ~~In addition to other applicable requirements in this code, storm~~ Storm shelters shall be constructed in accordance with ~~ICC 500.~~ this code and ICC 500, and shall be designated as hurricane shelters, tornado shelters, or combined hurricane and tornado shelters. Buildings or structures that are also designated as emergency shelters shall also comply with Table 1604.5 as Risk Category IV structures. Any storm shelter not required by this section shall be permitted to be constructed provided such structures meet the requirements of this code and ICC 500. **423.3 Occupancy classification.** The occupancy classification for a storm shelter shall be determined in accordance with this section. 423.3.1 **Dedicated storm shelters.** A facility designed to be occupied solely as a storm shelter shall be classified as Group A-3 for the determination of requirements other than those covered in ICC 500. **Exceptions:** 1. The occupancy category for dedicated storm shelters with an occupant load of less than 50 persons as determined in accordance with ICC 500 shall be in accordance with Section 303. 2. The occupancy category for a dedicated residential storm shelter shall be the Group R occupancy served. **423.3.2 Storm shelters within host buildings.** Where designated storm shelters are constructed as a room or space within a host building which will normally be occupied for other purposes, the requirements of this code for the occupancy of the building, or the individual rooms or spaces thereof, shall apply unless otherwise required by ICC 500.					coordination between the code and the storm shelter standard
G90-18	**Revise as follows:** ~~**SECTION 419**~~ ~~**LIVE/WORK UNITS**~~ **508.1 General.** Each portion of a building shall be individually classified in accordance with Section Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 ~~or~~, 508.4, 508.5, or a combination of these sections. **Exceptions:** 1. Occupancies separated in accordance with Section 510.	X			Minimal	Provides clearer description under Mixed Use Occupancies since the unit is not only residential

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		Decrease	None	Increase		
Sub Code:						
	2. Where required by Table 415.6.2, areas of Group H-1, H-2 and H-3 occupancies shall be located in a detached building or structure. 3. ~~Uses within live/work units, complying with Section 419, are not considered separate occupancies.~~ ~~419.1~~ **508.5 ~~General~~ Live/Work Units.** A live/work unit shall comply with Sections ~~419.1~~ 508.5 through ~~419.9.~~508.5.11. **Exception:** Dwelling or sleeping units that include an office that is less than 10 percent of the area of the dwelling unit are permitted to be classified as dwelling units with accessory occupancies in accordance with Section 508.2. ~~419.1.1~~ **508.5.1 Limitations.** All of the following shall apply to live/work areas: 1. The live/work unit is permitted to be not greater than 3,000 square feet (279 m^2) in area. 2. The nonresidential area is permitted to be not more than 50 percent of the area of each live/work unit. 3. The nonresidential area function shall be limited to the first or main floor only of the live/work unit. 4. Not more than five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time. ~~419.2~~ **508.5.2 Occupancies.** Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 shall not apply within the live/work unit where the live/work unit is in compliance with Section ~~419.~~ 508.5. Nonresidential uses that would otherwise be classified as either a Group H or S occupancy shall not be permitted in a live/work unit. **Exception:** Storage shall be permitted in the live/work unit provided that the aggregate area of storage in the nonresidential portion of the live/work unit shall be limited to 10 percent of the space dedicated to nonresidential activities. ~~419.3~~ **508.5.3 Means of egress.** Except as modified by this section, the means of egress components for a live/work unit shall be designed in accordance with Chapter 10 for the function served. ~~419.3.1~~ **508.5.4 Egress capacity.** The egress capacity for each element of the live/work unit shall be based on the occupant load for the function served in accordance with Table 1004.5. ~~419.3.2~~ **508.5.5 Spiral stairways.** Spiral stairways that conform to the requirements of Section 1011.10 shall be permitted. ~~419.4~~ **508.5.6 Vertical openings.** Floor openings between floor levels of a live/work unit are permitted without enclosure. ~~[F] 419.5~~ **508.5.7 Fire protection.** The live/work unit shall be provided with a monitored fire alarm system where required by Section 907.2.9 and an automatic sprinkler system in accordance with Section 903.2.8. ~~419.6~~ **508.5.8 Structural.** Floors within a live/work unit shall be designed for the live loads in Table 1607.1, based on the function within the space. ~~419.7~~ **508.5.9 Accessibility.** Accessibility shall be designed in accordance with					but also business use.

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CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Chapter 11 for the function served. ~~419.8~~ **508.5.10 Ventilation.** The applicable ventilation requirements of the International Mechanical Code shall apply to each area within the live/work unit for the function within that space. ~~419.9~~ **508.5.11 Plumbing facilities.** The nonresidential area of the live/work unit shall be provided with minimum plumbing facilities as specified by Chapter 29, based on the function of the nonresidential area. Where the nonresidential area of the live/work unit is required to be accessible by Section 1107.6.2.1, the plumbing fixtures specified by Chapter 29 shall be accessible.					
G92-18	Eliminates stationary storage battery systems as incidental use from Table 509. A rewrite of the IFC Section 1206 has added extensive protection features to such installations including detection, suppression, fire separation, and explosion control, along with large scale testing to document the effectiveness of chosen protection levels. With the increased level of protection mandated by the IFC, there is no longer a need to limit such uses to 10% of a floor area as an incidental use. This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as w ell as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac.	X			Minimal	Eliminates incidental use 10% floor area restriction which can reduce the cost of providing energy storage systems in mixed use buildings.
G132-18	**Revise as follows:** **[P] 1209.3 Privacy.** Public restrooms shall be visually screened from outside entry or exit doorways to ensure user privacy within the restroom. This provision shall also apply where mirrors would compromise personal privacy. Privacy at water closets and urinals shall be provided in accordance with Sections 1209.3.1 and 1209.3.2. **Exception:** Visual screening shall not be required for single-occupant toilet rooms with a lockable door.		X			Clarification
G149-18	**Modify as follows:** **3101.1 Scope.** The provisions of this chapter shall govern special building construction including membrane structures, temporary structures, pedestrian walkways and tunnels, automatic vehicular gates, awnings and canopies, marquees, signs, towers, antennas, relocatable buildings, swimming pool enclosures and safety devices, ~~and~~ solar energy systems, and public use restroom buildings on publicly owned lands in flood hazard areas. **SECTION ~~3112~~ 3114** **PUBLIC USE RESTROOM BUILDINGS IN FLOOD HAZARD AREAS** **~~3112~~ 3114.1 General.** ~~Public use restroom buildings that contain toilet rooms,~~	X			Minimal	Clarification

Table 7. 2021 IEBC Changes Cost Impact						
CODE CHANGE #	2021 IEBC CHANGE SUMMARY	IEBC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~bathrooms, showers and changing rooms, and those~~ ~~portions of buildings that contain~~ For the purpose of this section, public restroom buildings are located on publicly owned lands in flood hazard areas and intended for public use. Public restroom buildings and portions of other buildings that contain public restrooms, are limited to toilet rooms, bathrooms, showers and changing room~~s~~, ~~and where such~~. Public restroom buildings and portions of buildings ~~are intended for public use and located on publicly owned lands in flood hazard areas,~~ that contain public restrooms shall comply with the requirements of this section. Public use restrooms that are not elevated or dry floodproofed in accordance with Section 1612 shall comply with Section ~~3112~~ 3114.2. Portions of buildings that include uses other than public use toilet rooms, bathrooms, showers and changing rooms shall comply with Section 1612. **3114.2 Flood resistance.** Public use restrooms ~~that are located~~ on publicly owned lands in flood hazard areas shall comply with the requirements of ASCE 24, except for elevation requirements, and shall comply with all of the following criteria: 1. The building footprint is not more than 1,500 square feet. 2. Located, designed and constructed to resist the effects of flood hazards and flood loads to minimize flood damage from a combination of wind and water loads associated with the base flood. 3. Anchored to prevent flotation, collapse or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy during conditions of the base flood. 4. Constructed of flood damage-resistant materials. 5. Where enclosed by walls, the walls have flood openings. 6. Mechanical and electrical systems are located above the base flood elevation. 7. Plumbing fixtures and plumbing connections are located above the base flood elevation. 8. An emergency plan, approved by the jurisdiction, is submitted to the building official where the building design ~~specifies~~ documents specify implementation of protection measures prior to the onset of flooding conditions. **Exceptions:** 1. Minimum necessary electric ~~service~~ equipment required to address health, life safety and electric code requirements is permitted below the base flood elevation in accordance with ASCE 24 provisions for electric elements installed below the minimum elevations. 2. Plumbing fixtures and connections are permitted below the base flood elevation provided the fixtures and connections are designed and installed to minimize or eliminate infiltration of floodwaters into the sanitary sewage system and discharges from sanitary sewage systems into floodwaters.					

APPENDIX H

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	**2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY**		**NEC COST IMPACT**			**ESTIMATED AMOUNT***	**BENEFIT OF CHANGE**
			Decrease	None	Increase		
Sub Code:							
	Article 90	**Introduction**		X			
SR-7891	090.2(A)	NEC covers power exported from vehicles to premises		X			Clarification
FR-8206	090.2(A)	NEC covers shore power to ships and watercraft		X			Clarification
FR-8370	090.2(A)(5)	NEC covers shore power to ships and watercraft		X			Clarification
SR-7899	090.2(B)	NEC does not cover automotive vehicles		X			Clarification
FR-8764	090.6	Editorial		X			Clarification
	CHAPTER 1	**GENERAL**					
	Article 100	**Definitions**					
SR-7876	100	AC Module System.		X			Clarification
FR-8304	100	Accessible (as applied to equipment).		X			Clarification
FR-8517	100	Alternating-Current (ac) Module		X			Clarification
SR-7873							Clarification
FR-8519	100	Array.		X			Clarification
SR-7594	100	Bathroom.		X			Clarification
FR-7662	100	Bathroom.		X			Clarification
SR-7553	100	Battery.		X			Clarification
SR-7885	100	Bipolar Circuits.		X			Clarification
FR-8521	100	Bipolar Photovoltaic Array.		X			Clarification
SR-7797	100	Bonding Jumper, Main.		X			Clarification
FR-8070	100	Bonding Jumper, Main.		X			Clarification
SR-7933	100	Cable Bundle.		X			Clarification
SR-7582	100	Cable Sheath.		X			Clarification
FR-8807	100	Circuit Integrity (CI) Cable.		X			Clarification
FR-8804	100	Class 1 Circuit.		X			Clarification
FR-8805	100	Class 2 Circuit.		X			Clarification
FR-8806	100	Class 3 Circuit.		X			Clarification
FR-8403	100	Closet Storage Space.		X			Clarification
FR-7523	100	Coaxial Cable.		X			Clarification
SR-7585	100	Communications Circuit.		X			Clarification
FR-7657	100	Communications Circuit.		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7524	100	Communications Raceway.		X			Clarification
SR-7589	100	Communications Service Provider		X			Clarification
FR-7525	100	Composite Optical Fiber Cable.		X			Clarification
FR-7526	100	Conductive Optical Fiber Cable.		X			Clarification
SR-7538	100	Controller.		X			Clarification
FR-8187	100	Coordination, Selective (Selective Coordination…		X			Clarification
FR-7860	100	Copper-Clad Aluminum Conductors.		X			Clarification
SR-8036	100	Corrosive Environment.		X			Clarification
SR-7887	100	DC-to-DC Converter Output Circuit		X			Clarification
FR-8522	100	DC-to-DC Converter Output Circuit.		X			Clarification
FR-8938	100	DC-to-DC Converter.		X			Clarification
SR-7892	100	Direct-Current (dc) Combiner.		X			Clarification
FR-8525	100	Direct-Current (dc) Combiner.		X			Clarification
FR-8755	100	Diversion Charge Controller.		X			Clarification
FR-7515	100	Dust-Ignition proof [as applied to Hazardous (Classified) Locations		X			Clarification
FR-7516	100	Dust-tight.		X			Clarification
FR-7719	100	Electric Power Production and Distribution Network.		X			Clarification
SR-7787	100	Electric Vehicle Connector.		X			Clarification
SR-7783	100	Electric Vehicle Power Export Equipment		X			Clarification
SR-7789	100	Electric Vehicle Storage Battery.		X			Clarification
SR-7790	100	Electric Vehicle Supply Equipment		X			Clarification
FR-8397	100	Electric Vehicle Supply Equipment.		X			Clarification
FR-8389	100	Electric Vehicle.		X			Clarification
FR-8915	100	Electrical Datum Plane.		X			Clarification
FR-8527	100	Electrical Production and Distribution Network		X			Clarification
SR-7893	100	Electronic Power Converter.		X			Clarification
FR-8022	100	Electronically Protected (as applied to motors)		X			Clarification
SR-7542	100	Electronically Protected (as applied to motors)		X			Clarification
FR-7747	100	Encapsulation ΓÇ£mΓÇ¥.		X			Clarification
FR-8335	100	Equipment Rack.		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7718	100	Equipotential Plane.		X			Clarification
FR-8916	100	Equipotential Plane.		X			Clarification
SR-7764	100	Example D5(b) Optional Calculation for Multifamily		X			Clarification
FR-7971	100	Example D7 Sizing of Service Conductors for Dwelling		X			Clarification
FR-7518	100	Explosion proof Equipment.		X			Clarification
FR-8420	100	Fastened in Place.		X			Clarification
FR-8190	100	Fault Current		X			Clarification
FR-8191	100	Fault Current, Available		X			Clarification
SR-7950	100	Fault Current.		X			Clarification
SCR-14	100	Feeder		X			Clarification
FR-8464	100	Feeder Assembly.		X			Clarification
SCR-19	100	Feeder Neutral		X			Clarification
SR-7596	100	Feeder Neutral Conductor		X			Clarification
FR-8069	100	Feeder Neutral Conductor		X			Clarification
FR-9003	100	Feeder Short-Circuit and Ground-Fault Protection		X			Clarification
FR-8332	100	Field Evaluation Body (FEB).		X			Clarification
FR-8338	100	Field Labeled (as applied to evaluated products…		X			Clarification
SCR-72	100	Fitting		X			Clarification
SR-7928	100	Fitting.		X			Clarification
FR-8342	100	Fitting.		X			Clarification
FR-7749	100	Flameproof		X			Clarification
SR-8044	100	Fountain.		X			Clarification
FR-8731	100	Fountain.		X			Clarification
FR-7861	100	Free Air		X			Clarification
SR-7572	100	Free Air (as applied to conductors)		X			Clarification
FR-8986	100	Fuel Cell System.		X			Clarification
FR-8985	100	Fuel Cell.		X			Clarification
FR-8734	100	Functional Grounded PV System.		X			Clarification
SR-7655	100	Functional Grounded.		X			Clarification
SR-7773	100	Further Demand Factor		X			Clarification
SR-7862	100	Generating Capacity, Inverter.		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8532	100	Generating Capacity.		X			Clarification
FR-8947	100	Generating Capacity.		X			Clarification
SR-7804	100	Grounded Conductor.		X			Clarification
SR-8127	100	Grounded, Functionally.		X			Clarification
SR-7738	100	Ground-Fault Circuit Interrupter		X			Clarification
FR-7599	100	Ground-Fault Current Path.		X			Clarification
SR-7805	100	Grounding Conductor, Equipment		X			Clarification
FR-7602	100	Grounding Conductor, Equipment (EGC).		X			Clarification
FR-7666	100	Habitable Room		X			Clarification
SCR-15	100	Habitable Room		X			Clarification
SR-8049	100	Immersion Pool.		X			Clarification
SCR-58	100	Impedance Heating		X			Clarification
FR-7751	100	Increased Safety "e"		X			Clarification
SCR-22	100	Information Technology		X			Clarification
SR-7835	100	Information Technology Equipment Room		X			Clarification
FR-8531	100	Interactive Inverter Output Circuit.		X			Clarification
FR-8590	100	Interactive Inverter Output Circuit.		X			Clarification
SR-7545	100	Interactive Inverter.		X			Clarification
FR-7750	100	Interactive Inverter.		X			Clarification
FR-8536	100	Interactive System.		X			Clarification
FR-8987	100	Interactive System.		X			Clarification
FR-7753	100	Intrinsic Safety "I"		X			Clarification
FR-7684	100	Intrinsically Safe Circuit		X			Clarification
FR-8652	100	Invasive Procedure.		X			Clarification
SR-7564	100	Inverter Input Circuit		X			Clarification
FR-8983	100	Inverter Input Circuit.		X			Clarification
SR-7567	100	Inverter Output Circuit		X			Clarification
FR-8492	100	Inverter Output Circuit.		X			Clarification
FR-8984	100	Inverter Output Circuit.		X			Clarification
FR-8982	100	Inverter.		X			Clarification
SR-7953	100	Labeled.		X			Clarification
FR-8360	100	Labeled.		X			Clarification
FR-7682	100	Laundry Area		X			Clarification
SCR-16	100	Laundry Area		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-8141	100	Laundry Area.		X			Clarification
SR-7877	100	Limited Care Facility.		X			Clarification
FR-7502	100	Luminaire, Directly Controlled.		X			Clarification
FR-8214	100	Machinery Space (for Elevator, Dumbwaiter).		X			Clarification
FR-8988	100	Maximum System Voltage.		X			Clarification
FR-8656	100	Medical Office (Dental Office).		X			Clarification
FR-7864	100	Messenger or Messenger Wire		X			Clarification
SR-7573	100	Messenger or Messenger Wire.		X			Clarification
SR-8146	100	Microgrid Interconnect Device		X			Clarification
FR-8592	100	Microgrid Interconnect Device (MID).		X			Clarification
FR-8593	100	Microgrid System.		X			Clarification
SR-7902	100	Module.		X			Clarification
FR-8550	100	Module.		X			Clarification
SR-7903	100	Monopole Subarray Circuit.		X			Clarification
FR-8549	100	Monopole Subarray.		X			Clarification
FR-7766	100	Move definitions from 5xx.2 sections		X			Clarification
SR-7867	100	Multimode Inverter.		X			Clarification
FR-8551	100	Multimode Inverter.		X			Clarification
FR-8595	100	Multimode Inverter.		X			Clarification
FR-7808	100	Network-Powered Broadband Communications Circuit		X			Clarification
SR-8194	100	New Definition: Attachment Fitting		X			Clarification
SR-7671	100	New Definition: Reconditioned		X			Clarification
SR-7992	100	New Definition: Reconditioned		X			Clarification
SR-8074	100	New Definition: Reconditioned		X			Clarification
FR-7761	100	New Part III for Hazardous location definitions		X			Clarification
SR-7935	100	Nominal Current.		X			Clarification
FR-7528	100	Nonconductive Optical Fiber Cable.		X			Clarification
FR-7754	100	Oil Immersion "o"		X			Clarification
FR-7529	100	Optical Fiber Cable.		X			Clarification
FR-8991	100	Output Circuit.		X			Clarification
FR-8193	100	Overload.		X			Clarification
FR-8552	100	Panel.		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7551	100	Part-Winding Motors.		X			Clarification
FR-7965	100	Part-Winding Motors.		X			Clarification
FR-8553	100	Photovoltaic (PV) System.		X			Clarification
SR-7910	100	Photovoltaic Output Circuit.		X			Clarification
FR-8559	100	Photovoltaic Output Circuit.		X			Clarification
SR-7920	100	Photovoltaic Power Source.		X			Clarification
FR-8563	100	Photovoltaic Power Source.		X			Clarification
SR-8129	100	Photovoltaic Source Circuit.		X			Clarification
FR-8555	100	Photovoltaic Source Circuit.		X			Clarification
SR-8130	100	Photovoltaic System DC Circuit.		X			Clarification
FR-8557	100	Photovoltaic System DC Circuit.		X			Clarification
SCR-26	100	Pier		X			Clarification
SR-7716	100	Pier.		X			Clarification
FR-8989	100	Point of Common Coupling.		X			Clarification
FR-7755	100	Powder Filling "q"		X			Clarification
SR-8125	100	Power Production Equipment.		X			Clarification
FR-8598	100	Power Production Equipment.		X			Clarification
SR-8147	100	Power Source Output Circuit.		X			Clarification
FR-8808	100	Power-Limited Tray Cable (PLTC).		X			Clarification
FR-7862	100	Premises Community Antenna Television (CATV) Circuit		X			Clarification
FR-7756	100	Pressurization "p"		X			Clarification
SR-7791	100	Primary Pad.		X			Clarification
FR-7886	100	Prime Mover		X			Clarification
SR-7549	100	Prime Mover.		X			Clarification
FR-8101	100	Protection by Encapsulation "m"		X			Clarification
FR-7731	100	Protection by Enclosure "t"		X			Clarification
FR-8381	100	Qualified Person.		X			Clarification
SR-8223	100	Receptacle.		X			Clarification
FR-8246	100	Receptacle.		X			Clarification
SR-8072	100	Reconditioned		X			Clarification
SR-8227							Clarification
SCR-06							Clarification
SCR-07							Clarification
SCR-09							Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8470	100	Recreational Vehicle.		X			Clarification
FR-8758	100	Revision		X			Clarification
SR-8070	100	Service Drop.		X			Clarification
FR-8197							Clarification
SR-8068	100	Service Equipment.		X			Clarification
FR-8199							Clarification
FR-8195	100	Service.		X			Clarification
SR-7682	100	Service-Entrance Conductor Assembly		X			Clarification
FR-7519	100	Simple Apparatus [as applied to Hazardous (Classified) Locations		X			Clarification
SR-8244	100	Single-Pole Separable Connector.		X			Clarification
FR-8818							Clarification
SR-8052	100	Splash Pad.		X			Clarification
SR-8208	100	Stand-Alone (Islanded) Mode.		X			Clarification
SR-8218	100	Stand-Alone System.		X			Clarification
FR-8565							Clarification
FR-8728							Clarification
FR-8990							Clarification
SR-7555	100	Storage Battery.		X			Clarification
FR-8566	100	Subarray.		X			Clarification
SCR-17	100	Surge Arrester		X			Clarification
SCR-18	100	Surge-Protective Device		X			Clarification
SR-7635	100	Switch, Bypass Isolation.		X			Clarification
FR-8981							Clarification
SR-7820	100	Technical Power System.		X			Clarification
FR-8337							Clarification
SR-7547	100	Thermally Protected (as applied to motors)		X			Clarification
FR-8880	100	Type ITC Instrumentation Tray Cable		X			Clarification
FR-7758	100	Type of Protection "n"		X			Clarification
SR-7874	100	Unclassified Locations.		X			Clarification
SR-7772	100	Ungrounded Feeder Conductors		X			Clarification
SCR-77	100	Move definitions from 555.2		X			Clarification
	Article 110	**Requirements for Electrical Installations**					
FR-8484	110.12(C)			X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-8047	110.12(C)	Relocated power limited cabling requirements from chapters 7 & 8 to Article 110					Clarification
SR-8059	110.14	copper & copper-clad aluminum are no longer dissimilar materials		X			Clarification
SR-8069	110.14(D)	Clarifications for determining proper torque values for terminal connections		X			Clarification
FR-8510							Clarification
FR-8575	110.16(B)	Update 70E references to current edition		X			Clarification
SCR-71	110.21	Revision of definition for "Reconditioned". Requires original listing mark is to be removed as it no longer applies to the reconditioned equipment		X			Clarification
SR-8079	110.21(A)(2)						Clarification
FR-8580							Clarification
FR-8600	110.22(A)	The label requirement for disconnects does not apply to 1 and 2 family dwellings		X			Clarification
SR-8089	110.24(A)	Clarification to the fault current marking requirements		X			Clarification
FR-8617							Clarification
FR-8620	110.24(B)	Clarification to the fault current marking requirements		X			Clarification
FR-8621	110.26(A)	Informational note on hazards of working on energized equipment		X			Clarification
SR-8097							Clarification
SR-8098	110.26(A)(3)	The 6" allowance for intrusion of other electrical systems into the working space includes the support structures		X			Clarification
SR-8104	110.26(C)(2)	Requirements are added to 110.26(C)(2) to prevent open equipment doors from impeding the entry to or egress from the working space of large equipment			X		Operator Safety
FR-8653							
FR-8658	110.26(C)(3)	Add clarity regarding appropriate fire door hardware		X			Clarification
SR-8105	110.26(D)	Clarifies requirement to not use automatic controls for illumination of working spaces		X			Clarification
FR-8661	110.26(E)(2)	Editorial					Clarification
SR-8109	110.28	The new informational notes add clarity relative to installing enclosure types in the specified environments.		X			Clarification
FR-8672							Clarification
FR-8765	110.3(A)	Editorial		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8392	110.3(B)	As a result of the change to 424.19 to "lockable", there is an editorial rearrangement to eliminate redundancy.		X			Clarification
FR-8766	110.30	Editorial		X			Clarification
FR-8763	110.31	Update the edition of ANSI/IEEE C2 to 2017		X			Clarification
SR-8110	110.31(A)(4)	Editorial		X			Clarification
FR-8682							Clarification
SR-8111	110.31(A)(5)	Updated referenced edition of standard ANSI/ASTM E119.		X			Clarification
FR-8686	110.32	The word "or" is changed to "and" to require both conditions because it is a combination of height and width that creates the work space.		X			Clarification
SR-8114	110.33(A)(3)	This revision will add clarity regarding appropriate hardware.		X			Clarification
FR-8689							Clarification
SR-8116	110.40	Editorial		X			Clarification
SR-8027	110.5	Added copper-clad aluminum to conductor types		X			Clarification
FR-8767	110.51(A)	Editorial		X			Clarification
FR-8768	110.70	Editorial		X			Clarification
	CHAPTER 2	**WIRING AND PROTECTION**					
	Article 200	**Use and Identification of Grounded Conductors**					
FR-7631	200.10(B)	Clarified that the silver screw is used for the grounding terminal		X			Clarification
FR-7614	200.3	Editorial		X			Clarification
FR-7624	200.6(A)	Editorial		X			Clarification
SR-7807							Clarification
FR-7587	210.6(C)	Clarification of rules for 277V lighting		X			Clarification
SR-7530							Clarification
FR-7625	200.6(E)	Editorial		X			Clarification
SR-7808							Clarification
SR-7810							Clarification
FR-7629	200.9	Editorial		X			Clarification
SR-7813							Clarification
	Article 210	**Branch Circuits**					

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7688	210.1	New Definition: Dormitory		X			Clarification
SR-7515	210.2	New Definition: Dormitory Unit		X			Clarification
SR-7525	210.5(C)(1)	Editorial		X			Clarification
FR-7863	210.8	Editorial		X			Clarification
SR-7685	210.8	Editorial		X			Clarification
FR-8119	210.8(A)	Editorial		X			Clarification
FR-8122	210.8(A)	Editorial		X			Clarification
FR-7705	210.8(A)	Adds 250V receptacles and removes amperage limitations for GFCI protection for dwellings			X	Varies: 50 Amp 2 pole CB +$125	Occupant safety
FR-8120	210.8(A)(5)	GFCI added for finished as well as unfinished basements as all dwelling basements are prone to moisture and flooding			X	Max $15 for receptacle	Occupant safety
SR-7697	210.8(A)						
FR-8121	210.8(A)(11)	GFCI added for indoor damp and wet locations of dwellings			X	Max $15 for receptacle	Occupant safety
FR-8123	210.8(B)	Editorial		X			Clarification
FR-8128	210.8(B)	Editorial		X			Clarification
SR-7724	210.8(B)	Editorial		X			Clarification
FR-7791	210.8(B)	Editorial		X			Clarification
FR-8129	210.8(B)(2)	Clarifies definition of commercial kitchen		X			Clarification
FR-8124	210.8(B)(8)	GFCI added for accessory buildings of non-dwellings			X	Max $15 for receptacle	Occupant safety
FR-8125	210.8(B)(10)	Editorial		X			Clarification
FR-8126	210.8(B)(11)	GFCI added for laundry areas of nondwellings			X	Max $15 for receptacle	Occupant safety
FR-8127	210.8(B)(12)	GFCI added for locations within 6 feet of a bathtub or shower in a non-dwelling			X	Max $15 for receptacle	Occupant safety
SR-7733	210.8(C)	GFCI for boat hoists moved to 555.9		X			Clarification
FR-7852	210.8(D)	The GFCI requirement for dishwashers was moved to 422.		X			Clarification
SR-7587	210.8(E)	GFCI required for receptacles for equipment requiring servicing in non-dwellings			X	Max $15 for receptacle	Occupant safety
SR-7737	210.8(E)	Editorial		X			Clarification

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			Decrease	None	Increase		
Sub Code:							
FR-7689	210.8(E)	Editorial		X			Clarification
SR-7676	210.8(F)	Adds 250V receptacles and removes amperage limitations for GFCI protection.					Clarification
FR-7547	210.11(C)(3)	Clarifies that a dedicated circuit is required for bathroom outlets		X			Clarification
FR-7549	210.11(C)(4)	Clarifies that the garage receptacle must be supplied by a 20A circuit		X			Clarification
FR-8131	210.12	Informational note edited		X			Clarification
SR-8245	210.12(A)	Item 5: Clarifies the metal raceway requirement for AFCIs		X			Clarification
FR-8130	210.12(A)	Exception: Clarifies the metal raceway requirement for AFCIs		X			Clarification
FR-7977	210.12(C)	Adds AFCI protection to patient sleeping rooms in nursing homes and limited care facilities			X	$50/ circuit	Occupant safety
FR-7963	210.12(D)	Add AFCI protection to guest rooms and suites for renovations			X	$50/ circuit	Occupant safety
FR-8132	210.12(D)	Exception: AFCI protection not required for modifications where conductors are less than 6'		X			Clarification
FR-8106	210.13	Editorial		X			Clarification
SR-7657	210.15	GFCI and AFCI equipment cannot be reconditioned		X			Occupant safety
FR-7981	210.19(A)(1)	Clarification		X			Clarification
SR-7752							Clarification
SCR-13							Clarification
FR-7984	210.19(A)(3)	Clarification		X			Clarification
FR-9004	210.19(A)	Editorial		X			Clarification
FR-7517	210.25(B)	Informational note to clarify definition of a common area in a multioccupant building		X			Clarification
FR-7619	210.50	Editorial		X			Clarification
SR-7601	210.52	Editorial		X			Clarification
FR-7520	210.52(B)(1)	Clarification		X			Clarification
FR-7521	210.52(C)	Clarification to the spacing of receptacles on countertops and peninsulas		X			Clarification
SR-7644							Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-8246							Clarification
FR-7537	210.52(C)(1), 210.52(C)(2), 210.52(C)(3)						Clarification
SR-8247	210.52			X			Clarification
FR-7598	210.52(E)(3)	Clarifies the definition of an attached deck		X			Clarification
FR-7604	210.52(G)	Adds receptacle requirement to garages in multifamily dwellings			X	$75/ garage	Occupant convenience
FR-7849	210.60	Editorial		X			Clarification
FR-7588	210.63, 210.64	Receptacles for servicing equipment must be on the same level as equipment for outdoor installations, and within the same room for indoor installations.		X			Clarification
SR-7566	210.63						Clarification
FR-7593	210.65	Editorial		X			Clarification
FR-7589	210.70(A)(1)	Clarifies rules on required light switches and allows for remote controlled/wireless systems to be used		X			Clarification
FR-7590	210.70(A)(2)						Clarification
FR-7591	210.70(A)(3)						Clarification
FR-7592	210.70(B)						Clarification
FR-7612	210.70(C)						Clarification
	Article 215	**Feeders**		X			
FR-8269	215.2(A)	Editorial		X			Clarification
FR-8270	215.2(B)	Editorial		X			Clarification
FR-8271	215.3	Editorial		X			Clarification
FR-8272	215.6	Editorial		X			Clarification
FR-8273	215.9	Removed limitation of 15 and 20 amp for GFCI protection		X			Clarification
FR-8361	215.10	Temporary feeders used during repair, maintenance, and emergencies do not have to use GFCI is used for less than 90 days		X			Clarification
SR-7858	215.10	Editorial		X			Clarification
	Article 220	**Branch-Circuit, Feeder, and Service Load Calculations**					
FR-8104	220.11	New section: clarifies how to calculate floor area		X			Clarification

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			Decrease	None	Increase		
Sub Code:							
FR-8075	220.12	Revised Table 220.12 to modify lighting loads used for load calculations to use values and classifications that align with ASHRAE 90.1. Most load values decreased, four increased.	X			Varies	Lower cost
FR-8076	220.14(J)	Revised: lighting loads for dwellings moved from Table 220.12 to this section.		X			Clarification
SR-7754							Clarification
FR-8077	220.14(K)	Removed the load "Banks" as it is now included in "Office Buildings"		X			Clarification
FR-8071	220.14(M)	New Section to reorganize hotel and motel occupancies. Editorial changes only.		X			Clarification
SR-7758							Clarification
FR-8079	220.16(A)	Editorial		X			Clarification
FR-8080	220.42	Delete demand factors for hospital lighting. Lighting load values for hospitals have been reduced and these demand factors are no longer accurate.		X			Clarification
SR-7759							Clarification
FR-8057	220.53	Adds ovens and cooktops cooking appliances to dwelling unit items that cannot be derated using the 75% demand factor		X			Clarification
SR-7755							Clarification
FR-8062	220.60	Clarification		X			Clarification
FR-8081	220.87	Clarification		X			Clarification
SR-7756							Clarification
	Article 225	**Outside Branch Circuits and Feeders**		X			
FR-8678	225.1	Editorial		X			Clarification
SR-7860	225.3	Editorial		X			Clarification
FR-8363	225.4	Editorial		X			Clarification
FR-8366	225.5	Editorial		X			Clarification
FR-8369	225.8	Deleted redundant material		X			Clarification
FR-8274	225.10	Removed multiconductor cable, Added type SE (a multiconductor cable), added type TC-ER		X			Clarification
SR-7863							Clarification
FR-8275	225.15	Clarification		X			Clarification

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Sub Code:							
FR-8276	225.17(A)	Editorial		X			Clarification
FR-8277	225.19	Clarification		X			Clarification
FR-8278	225.22	Relocated to article 300		X			Clarification
SR-7864	225.22	Relocated back to article 225		X			Clarification
FR-8279	225.25	Editorial		X			Clarification
FR-8281	225.30(A)	Added docking facilities and piers to locations where more than one service can be used.		X			Clarification
FR-8280	225.30(B)	When multiple feeders originate from a common piece of equipment, but terminante in separate disconnects, the disconnects must be group in one location, and labled to indicate load served. Not more than sixe feeders permitted.		X			Clarification
SR-7866	225.30	Editorial		X			Clarification
FR-8362	225.32	Editorial		X			Clarification
FR-8364	225.52(B)	Editorial		X			Clarification
FR-8365	225.52(C)	Editorial		X			Clarification
FR-8679	225.60(C)	Editorial		X			Clarification
FR-8680	225.61(B)	Editorial		X			Clarification
	Article 230	**Services**					
FR-8454	230.11	Created new section for power distribution blocks, then moved it to 230.46		X			Clarification
SR-8015							Clarification
FR-8451	230.23	Editorial		X			Clarification
FR-8452	230.24(B)	Editorial		X			Clarification
FR-8632	230.28(A)	Editorial		X			Clarification
FR-8453	230.31	Editorial		X			Clarification
FR-8455	230.40	Editorial		X			Clarification
FR-8456	230.42	Editorial		X			Clarification
FR-8457	230.43	Added type TC-ER cable for services		X			Clarification
FR-8458	230.44	Added type TC-ER cable for services in cable trays		X			Clarification

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			Decrease	None	Increase		
Sub Code:							
SR-7871	230.46	Added provision to tap service conductors (in addition to the splice provision). Added requirement that power distribution blocks be marked "suitable for use on the line side of the service equipment" or equivalent - delayed implementation until January 1, 2023		X			Clarification
FR-8459 SR-7896	230.62(C)	New Section: Barriers shall be placed in service equipment such that no uninsulated, ungrounded service busbar or service terminal is exposed to inadvertent contact by persons or maintenance equipment while servicing load terminations.			X	Minimal	Safety
FR-8460	230.66	Editorial		X			Clarification
SR-7897	230.66(B)	Editorial		X			Clarification
FR-8546 SR-7898	230.67	New Section: Add surge protection to dwelling unit services			X	$150/ 200A Service	Protect sensitive electronics such as AFCI, GFCI, and smoke alarms
FR-8461	230.70	Editorial		X			Clarification
FR-8463 SR-7901	230.71	This revision continues to retain the six service disconnect rule for services. However, to address these challenges, the permission for up to six service disconnects is modified to require installation in separate enclosures.			X	Varies	Eliminate the need to work on energized equipment
SCR-33	230.72	Editorial		X			Clarification
FR-8622	230.75	Editorial		X			Clarification
SR-7912	230.82	Editorial		X			Clarification
FR-8627	230.82(1)	Editorial		X			Clarification
FR-8626	230.82(3)	Editorial		X			Clarification
FR-8624	230.82(5)	Editorial		X			Clarification
FR-8625	230.82(6)	PV system can be used as service disconnect if listed for that use		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
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			Decrease	None	Increase		
Sub Code:							
FR-8623	230.82(10)	New section: Can use the external dwelling disconnect added in 230.85 as service disconnect, if listed for use		X			Clarification
FR-8628	230.82(11)	New section: Meter disconnect can be used as service disconnect, if listed		X			Clarification
FR-8462 SR-7924	230.85	New Section: Requires outdoor accessible mounted emergency disconnects for 1 and 2 family dwellings			X	$100/ 200 Amp meter-main breaker combo	1st Responder Safety
FR-8629	230.90(A)	Editorial		X			Clarification
FR-8630	230.200	Editorial		X			Clarification
FR-8631	230.205(B)	Editorial		X			Clarification
SR-8065	230.208	Editorial		X			Clarification
	Article 240	**Overcurrent Protection**					
FR-8633	240.2	Editorial		X			Clarification
FR-8634	240.4	Editorial		X			Clarification
FR-8635	240.5(B)(2)	Clarification		X			Clarification
FR-8636	240.6(C)	Clarification		X			Clarification
SR-7955	240.6(C)	Editorial		X			Clarification
FR-8675	240.13	Editorial		X			Clarification
FR-8676	240.21	Editorial		X			Clarification
SR-7956	240.21(B)	Clarification		X			Clarification
FR-8637	240.23	Deleted: duplicate rules in 220.61		X			Clarification
FR-8638	240.24(A)	Editorial		X			Clarification
SR-7961	240.24(A)	Editorial		X			Clarification
FR-8639	240.24(E)	Editorial		X			Clarification
FR-8669 SR-8022	240.33	Editorial		X			Clarification Clarification
FR-8640	240.40	Editorial		X			Clarification
SR-7974	240.62	New Section: Low-voltage fuseholders and low-voltage nonrenewable fuses shall not be permitted to be reconditioned.		X			Clarification
FR-8641	240.67(B)	Adds "Current limiting, electronically actuated fuses" as an acceptable method of arc energy reduction		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7991	240.67(A), 240.67(B)	Clarifies the documentation requirement for arc energy reduction method		X			Clarification
SR-8020	240.67(C)	Requires performance testing of arc energy reduction systems, whenever such systems are required.			X	$1,000 / test	Clarification
FR-8642	240.86	Editorial		X			Clarification
FR-8643	240.86(C)	Editorial		X			Clarification
SR-7999	240.87(A), 240.87(B)	Clarifies the documentation requirement for arc energy reduction method		X			Clarification
FR-8671	240.87(B)	Clarification		X			Clarification
SR-8030	240.87(C)	Requires performance testing of arc energy reduction systems, whenever such systems are required.			X	$1,000 / test	Clarification
SR-8011	240.88	Reconditioned overcurrent devices must be listed as "reconditioned." Clarifies which types of overcurrent devices and components can be reconditioned.		X			Clarification
FR-8677	240.90	Editorial		X			Clarification
FR-8673	240.91(B)	Revision		X			Clarification
SR-8046	240.91(B)	Editorial		X			Clarification
SR-8048	240.102	New Section: Medium voltage fuseholders and nonrenewable fuses cannot be reconditioned		X			Clarification
	Article 242	**Overvoltage Protection**					
FR-8221	242	New Article: Articles 280 & 285 have been merged into new article 242 to provide a single article for clarity and usability		X			Clarification
SR-8083							Clarification
SCR-34							Clarification
SR-8066							Clarification
	Article 250	**Grounding and Bonding**					
FR-8196	250.2	New definition: Disconnect, supply-side (coordinate with new provision 230.85)		X			Clarification
SR-7780		Delete new definition: Disconnect, supply-side		X			Clarification
FR-9007	250.2	Definition moved to article 100		X			Clarification
SR-7815	250.3	Editorial		X			Clarification
FR-7637	250.4	Editorial		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8107	250.6(D)	Editorial		X			Clarification
SR-7817	250.6(D)	Editorial		X			Clarification
FR-7639	250.12	Clarification		X			Clarification
FR-7651	250 Part II	Editorial		X			Clarification
SR-7781							Clarification
FR-7643	250.20(B)	Clarification		X			Clarification
FR-8061	250.24	Editorial		X			Clarification
SR-7782							Clarification
FR-8198	250.25	New section created to cover the requirements of supply-side disconnect (see 230.85)		X			Clarification
SR-7778							Clarification
FR-7680	250.26	Editorial		X			Clarification
FR-7685	250.28(A)	Updated bonding jumper materials to include aluminum and copper-clad aluminum		X			Clarification
FR-8108	250.28(C)	Editorial		X			Clarification
FR-8118	250.28(D)(2)	New section created to cover the requirements of supply-side disconnect (see 230.85)		X			Clarification
SR-7784							Clarification
FR-8097	250.30	The revised text in the first paragraph of 250.30 clarifies that multiple separately derived systems of the same type connected in parallel are considered to be a single separately derived system		X			Clarification
SR-7785	250.30(A)(2)	Editorial		X			Clarification
FR-7759	250.32(A)	Clarification		X			Clarification
SR-7786							Clarification
FR-8109	250.32(D)	Editorial		X			Clarification
FR-7818	250.34	Trailer mounted generators were added to this section because they are similar to vehicle mounted generators and need to be covered.		X			Clarification
FR-7781	250.36	Editorial		X			Clarification
FR-8060	250.53	Revised for clarity		X			Clarification
SR-7818	250.53(C)	Rebar shall not used as a conductor to interconnect the electrodes of grounding electrode systems		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7973	250.64(A)	Revised for clarity		X			Clarification
SR-7775							Clarification
SR-7777	250.64(A)(1)	Clarifies conditions for using aluminum grounding electrodes		X			Clarification
FR-7898	250.64(B)(2), 250.64(B)(3)	When PVC conduit is used for physical protection, Schedule 80 is required			X	Minimal	Protect from damage
FR-7980	250.64(E)(1)	The revised text clarifies that cable armor is required to be bonded and grounded.		X			Clarification
FR-7902	250.64(E)(3)	This revision makes it clear that the bonding jumper size is determined by the largest grounding electrode conductor installed		X			Clarification
SR-7825	250.66	Editorial		X			Clarification
FR-7985	250.68(C)	Clarification on use of rebar as a grounding electrode		X			Clarification
FR-7920	250.92(B)	Editorial		X			Clarification
SR-7838	250.94(A)	Editorial		X			Clarification
FR-8110	250.96(B)	Editorial		X			Clarification
SR-7794	250.96(B)	Editorial		X			Clarification
FR-7990	250.98	Expansion deflection and deflection fittings were added to the list of fittings required to be made electrically continuous.		X			Clarification
FR-8111	250.102(B)	Editorial		X			Clarification
FR-8031	250.104(A)(1)	Editorial		X			Clarification
FR-8033	250.104(A)(3)	Editorial		X			Clarification
SR-7795	250.104(B)	Editorial		X			Clarification
FR-8034	250.104(C)	Editorial		X			Clarification
FR-8035	250.104(D)(1), 250.104(D)(2)	The change that was made as a result of changing the reference from Table 250.66 to Table 250.102(C)(1) in the 2017 cycle resulted in an inadvertent increase in the bonding conductor size.		X			Clarification
FR-8038	250.106	Editorial		X			Clarification
SR-7839	250.109	New Section: Metal Enclosures can be used as a ground-fault path	X			Minimal	Clarification
FR-8039	250.112(K)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8040	250.114	Revised for clarity		X			Clarification
FR-8041	250.118	Revised for clarity		X			Clarification
SR-7840	250.119	Revised the dc threshold to 60 volt to be consistent with the current use for PoE circuits		X			Clarification
FR-8043	250.119(B)	Revised for clarity		X			Clarification
FR-8066	250.120(B)	Revised for clarity where aluminum or coper-clad aluminum conductors can be used		X			Clarification
SR-7774							Clarification
FR-7544	250.121	Revised for clarity		X			Clarification
SR-7757							Clarification
FR-8114	250.122	Minor revisions to table 250.122 for selection of equipment grounding conductor along with revisions for clarity		X			Clarification
SR-7760							Clarification
SCR-05							Clarification
FR-7527	250 Part VII	Revised for clarity		X			Clarification
SR-7841	250.132	Revised for clarity		X			Clarification
FR-7541	250.134	Revised for clarity		X			Clarification
FR-7542	250.136	The sentence that prohibits the use of the metal frame of a building as an equipment grounding conductor is moved to 250.121		X			Clarification
SR-7842	250.138	Revised for clarity		X			Clarification
FR-7545	250.142(A)	Editorial		X			Clarification
SR-7843							Clarification
FR-7548	250.142(B)	Exception No. 3 is removed because 250.164 does not specifically address making a grounded conductor connection on the load side of the disconnecting means.		X			Clarification
SR-7845							Clarification
FR-7654	250.146	Revised for clarity		X			Clarification
SR-7844	250.146(D)	Revised for clarity		X			Clarification
FR-8115	250.148	Section 250.148(E) is deleted because it is already required by 250.8(B).		X			Clarification
SR-7846	250.148						Clarification
FR-8112	250.168	Revised for clarity		X			Clarification
FR-7566	250.174(C)	Revised for clarity		X			Clarification
FR-7568	250.176	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7847							Clarification
FR-8113	250.180	Revised for clarity		X			Clarification
FR-7814	250.184(A)(1)	Exception No. 1 does not apply to single-point grounded systems since bare underground neutral conductors would be grounded a multiple locations.		X			Clarification
FR-7819	250.184(C)	The NESC recently revised their language to allow long cable runs such as those for wind farms and solar farms to still be considered multi-point grounded but not held to the 400 m (1300 ft) maximum length between bonding of the neutral conductor to a grounding electrode. The reasoning is that removing the cable jacket only to create a point for bonding creates a less desirable condition than allowing further space between bonds. Removing the jacket creates a weak spot in the cable that could lead to premature cable failure, and the bonding is also bonding to the shielding material potentially affecting the shielding of the cables that could allow for undesirable EMF to occur at the point where this would occur.		X			Clarification
FR-7820	250.187	Revised for clarity		X			Clarification
SR-7848	250.187(B)	Revised for clarity		X			Clarification
	Article 280	**Surge Arresters, Over 1000 Volts (Relocated)**					
	Article 285	**Surge-Protective Devices (SPDs), 1000 Volts or Less (Relocated)**					
FR-8116	280, 285	New Article: Articles 280 & 285 have been merged into new article 242 to provide a single article for clarity and usability		X			Clarification
	CHAPTER 3	**WIRING METHODS AND MATERIALS**					
	Article 310	**Conductors for General Wiring**					
FR-8649	300.3(B)(1)	Revised for clarity		X			Clarification
SR-7849							Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7853	300.3(B)(3)	Revised for clarity		X			Clarification
FR-8651	300.3(C)(1)	Revised for clarity		X			Clarification
FR-8667	300.4(G)	Revised for clarity		X			Clarification
SR-7865							Clarification
FR-8684	300.7(A)	Revised for clarity		X			Clarification
FR-8727	300.11(B)(1)	Revised for clarity		X			Clarification
SR-7882							Clarification
FR-8696	300.15(F)	Revised for clarity		X			Clarification
SR-7886							Clarification
FR-8726	300.19(C)	Revised for clarity		X			Clarification
FR-8730	300.22(C)	Revised for clarity		X			Clarification
FR-8729	300.22(D)	Revised for clarity		X			Clarification
FR-8742	300.25	New Section: Restrict wiring in exit enclosures to comply with NFPA 101		X			Safety
SR-7888	300.25	Revised for clarity		X			Clarification
FR-8736	300.40	Revised for clarity		X			Clarification
FR-8738	300.45	The signal word “Danger” is required in the sign. This prompts specific requirements to comply with ANSI Z535.4.		X			Safety
	Article 310	**Conductors for General Wiring**					
SCR-52	310, 311	Update references to articles 310 & 311 throughout code		X			Clarification
SR-7730	310.4	The mm equivalent of 55 mils for SIS cable was corrected from 2.41 to 1.40.		X			Clarification
SR-7612	310.6(C)	Equipment grounding conductors have specific color requirements in the NEC. Other grounding and bonding conductors may not have specific color requirements.		X			Clarification
SR-7633	310.8(B)(1)	Rubber was changed to thermoset to harmonize with changes made elsewhere in the NEC.		X			Clarification
SR-7636	310.8(B)(2)	Revised for clarity		X			Clarification
SR-7638	310.12	Revised for clarity		X			Clarification
SR-7650	310.15	Revised for clarity		X			Clarification
SCR-45	310.15	Revised for clarity		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8918	310.15(B)(3)(C)	Relocate text from 310.15(B)(3)(c) to this section relating to temperature correction.		X			Clarification
SCR-46	310.16, 310.17, 310.18	Revised for Clarity		X			Clarification
SR-7651	310.16, 310.17, 310.18, 310.19, 310.20, 310.21	Added PFA, XHHN and Z to 90C copper. Revised for clarity.		X			Clarification
	Article 311	**Medium Voltate Conductors and Cables**					
FR-8030	311	New Article: In order to consolidate the medium voltage requirements found in Articles 310 and 328, and to improve the usability of the code, the requirements are being combined into a new article 311.		X			Clarification
SR-7577	311.1	Editorial		X			Clarification
SR-7574	311.10	Editorial		X			Clarification
SR-7576	311.16(C)	Editorial		X			Clarification
SR-7578	311.32	Editorial		X			Clarification
SR-7579	311.36	Editorial		X			Clarification
	Article 312	**Cabinets, Cutout Boxes, and Meter Socket Enclosures**					
FR-7511	312.5(C)	Revised for Clarity		X			Clarification
SR-8157							Clarification
FR-7536	312.6	Revised for clarity		X			Clarification
SR-8158	312.6(A)	Revised for clarity		X			Clarification
FR-7538	312.6(B)(2)	Revised for clarity		X			Clarification
SR-8160							Clarification
FR-7539	312.8(B)	Adds term "Energy managing" to "power monitoring". Add provision for use of small conductors for sensors.		X			Clarification
SR-8161							Clarification
	Article 314	**Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; Fittings; and Handhole Enclosures**					
FR-7543	314.16	Revised for clarity		X			Clarification
FR-7540	314.16(A)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7531	314.16(B)(5)	The requirement for the volume allowance for equipment grounding conductors and equipment bonding jumpers is revised to add an additional ¼ volume allowance to the existing volume allowance.		X			Clarification
FR-7546	314.17	cable designs with nonmetallic sheaths or coverings need to be addressed in these requirements.		X			Clarification
FR-7557	314.17(A)	Revised for clarity		X			Clarification
FR-7554	314.19	recognizes there is equipment other than “devices” that may be flush mounted in boxes.		X			Clarification
FR-7555	314.23(B)(1)	Revised for clarity		X			Clarification
FR-7706	314.23(D)(2)	Revised for clarity		X			Clarification
FR-7559	314.23(H)(2)	Revised for clarity		X			Clarification
FR-7560	314.25	Revised for clarity		X			Clarification
FR-7563	314.27(C)	recognizes that paddle fans can now be installed on outlet boxes with two current carrying conductors with the advent of the remote-controlled paddle fans.		X			Clarification
SR-8163	314.27(C)	The first revision was further refined to ensure the longstanding and safe practice of supporting a ceiling-suspended (paddle) fan by the structural framing, and independent of the outlet box, remains a viable option.		X			Clarification
FR-7570	314.28(E)(1)	Revised for clarity		X			Clarification
SR-8236	314.29	Revised for clarity		X			Clarification
FR-7745	314.29	Revised for clarity		X			Clarification
FR-7578	314.30	Revised for clarity		X			Clarification
FR-7579	314.40(D)	Revised for clarity		X			Clarification
	Article 320	**Armored Cable: Type AC**					
FR-7873	320.2	Revised for clarity		X			Clarification
FR-7874	320.15	Revised for clarity		X			Clarification
FR-7876	320.23(A)	Revised for clarity		X			Clarification
FR-7877	320.30(C)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7959	320.80(A)	multiple cables in contact with thermal insulation create the potential for heating beyond the capabilities of the cables. This language will require spacing between the cables or derating of the conductor ampacity.		X			Clarification
	Article 322	**Flat Cable Assemblies: Type FC**					
FR-7866	322.2	Revised for clarity		X			Clarification
	Article 324	**Flat Conductor Cable: Type FCC**					
FR-7871	324.2	Revised for clarity		X			Clarification
FR-7872	324.42(A)	Revised for clarity		X			Clarification
SR-7598	324.60	Revised for clarity		X			Clarification
	Article 326	**Integrated Gas Spacer Cable: Type IGS**					
FR-7868	326.2	Revised for clarity		X			Clarification
	Article 330	**Metal-Clad Cable: Type MC**					
FR-7879	330.2	Revised for clarity		X			Clarification
FR-7885	330.15	Revised for clarity		X			Clarification
FR-7961	330.80	multiple cables in contact with thermal insulation create the potential for heating beyond the capabilities of the cables. This language will require spacing between the cables or derating of the conductor ampacity.		X			Clarification
SR-7742	330.80(B)	Revised for clarity		X			Clarification
SR-7736	330.104	The minimum size copper-clad aluminum conductor size was reduced to 14 AWG for control and signal conductors based on data submitted to the panel.		X			Clarification
FR-7883	330.130	New Section: Clarifies requirements for using MC cable in hazardous environments		X			Clarification
SR-7590							Clarification
SCR-47							Clarification
	Article 332	**Mineral-Insulated, Metal-Sheathed Cable: Type MI**					
FR-7870	332.2	Revised for clarity		X			Clarification
	Article 334	**Nonmetallic-Sheathed Cable: Types NM, NMC, and NMS**					

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7745	334	Revised title to remove type NMS, which is no longer manufactured		X			Clarification
FR-8002	334.2	Revised for clarity		X			Clarification
FR-8005	334.6	Revised for clarity		X			Clarification
FR-8020	334.10	Revised for clarity		X			Clarification
FR-8045	334.12	Revised title to remove type NMS, which is no longer manufactured		X			Clarification
SR-7727	334.12(A)	Revised for clarity		X			Clarification
SCR-48	334.12(A)	Revised for clarity		X			Clarification
FR-8046	334.15	Revised for clarity		X			Clarification
FR-8047	334.17	Revised title to remove type NMS, which is no longer manufactured		X			Clarification
FR-8048	334.24	Revised for clarity		X			Clarification
FR-8049 SR-7728	334.30	The cable length between the cable entry and the closest cable support shall not exceed 450 mm (18 in.).		X			Safety
FR-8050	334.80	Revised for clarity		X			Clarification
FR-8051	334.104	Control and signaling conductors shall be no smaller than 18 AWG copper.		X			Clarification
FR-8053	334.116(C)	Revised title to remove type NMS, which is no longer manufactured		X			Clarification
	Article 336	**Power and Control Tray Cable: Type TC**					
FR-7635	336.2	Revised for clarity		X			Clarification
FR-8032	336.10	Revised for clarity		X			Clarification
SR-7689	336.10	The designation “TC-ER-JP” was added to the mandatory language and the informational note was deleted.		X			Clarification
FR-7676	336.80	Revised for clarity		X			Clarification
SR-7739	336.104	Revised for clarity		X			Clarification
FR-7647	336.130	New Section: This language addresses construction requirements for tray cables installed in hazardous locations, including suitability for the environment and compatibility with connectors.		X			Clarification
SR-7674							Clarification
	Article 337	**Type P Cable**					Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8036	337	New Article: Type P (IEEE-1580/UL-1309) Marine Shipboard Cable is flexible and rugged and is highly suitable for petrochemical applications and oil and gas well drilling land based rigs because of its ability to resist various chemicals, abrasives, and petroleum based additives as well as its ability to resist damage from vibration, shaking, and movement that occurs in many processes have a long successful history of more than 4 decades in installations in the most adverse conditions.		X			Clarification
SR-7729							Clarification
	Article 338	**Service-Entrance Cable: Types SE and USE**					
FR-7953	338.2	The language recommended by the CC Task Group on definitions was added and a new definition was added to clarify the difference between an assembly and a cable.		X			Clarification
FR-7955	338.10(B)(4)	his language will require spacing between the cables or ampacity adjustment.		X			Clarification
SR-7678							Clarification
FR-7950	338.100	Due to concerns for corrosion the allowance for use of a bare conductor was removed.		X			Clarification
SR-7680							Clarification
	Article 340	**Underground Feeder and Branch-Circuit Cable: Type UF**					
FR-7765	340.2	Revised for clarity		X			Clarification
FR-7777	340.10	Revised for clarity		X			Clarification
FR-7776	340.12	Revised for clarity		X			Clarification
	Article 342	**Intermediate Metal Conduit: Type IMC**		X			
FR-7983	342.2	Revised for clarity		X			Clarification
FR-8023	342.10(E)	New Section: Clarifies that IMC can be installed where subject to severe physical damage		X			Clarification
FR-7986	342.14	Stainless steel fittings are permitted to be used with galvanized steel IMC.		X			Clarification
FR-7987	342.22	Revised for clarity		X			Clarification
SR-7503	342.22	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7988	342.28	Revised for clarity		X			Clarification
FR-8021	342.100	Revised for clarity		X			Clarification
FR-7991	342.130	Information not necessary and deleted		X			Clarification
	Article 344	**Rigid Metal Conduit: Type RMC**					
FR-7992	344.2	Revised for clarity		X			Clarification
FR-7993	344.10(A)	Revised for clarity		X			Clarification
FR-7994	344.10(D)	New Section: RMC can be installed where subject to severe damage		X			Clarification
FR-8025	344.14	Stainless steel fittings are permitted to be used with galvanized steel RMC.		X			Clarification
FR-8026	344.22	Revised for clarity		X			Clarification
SR-7504	344.22	Revised for clarity		X			Clarification
FR-7995	344.28	Revised for clarity		X			Clarification
FR-7996	344.130	Information not necessary and deleted		X			Clarification
	Article 348	**Flexible Metal Conduit: Type FMC**					
FR-7921	348.2	Revised for clarity		X			Clarification
FR-8003	348.22	Revised for clarity		X			Clarification
SR-7505	348.22	Revised for clarity		X			Clarification
	Article 350	**Liquidtight Flexible Metal Conduit: Type LFMC**					
FR-7922	350.2	Revised for clarity		X			Clarification
FR-7923	350.10	Conductors or cables with higher temperature ratings are permitted to be used in LFMC as long as the conductors or cables are not operated at a higher temperature than the conduit temperature rating.		X			Clarification
SR-7610							Clarification
FR-7926	350.12	Revised for clarity		X			Clarification
FR-7928	350.22(A)	Revised for clarity		X			Clarification
FR-8006	350.30(A)	Revised for clarity		X			Clarification
SR-7506	350.22(A)	Revised for clarity		X			Clarification
	Article 352	**Rigid Polyvinyl Chloride Conduit: Type PVC**					
FR-7934	352.2	Revised for clarity		X			Clarification
FR-8008	352.22	Revised for clarity		X			Clarification
SR-7507	352.22	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
	Article 353	**High Density Polyethylene Conduit: Type HDPE**					
FR-7904	353.2	Revised for clarity		X			Clarification
FR-7905	353.22	Revised for clarity		X			Clarification
SR-7508	353.22	Revised for clarity		X			Clarification
	Article 354	**Nonmetallic Underground Conduit with Conductors: Type NUCC**					Clarification
FR-7906	354.2	Revised for clarity		X			Clarification
	Article 355	**Reinforced Thermosetting Resin Conduit: Type RTRC**					
FR-7908	355.2	Revised for clarity		X			Clarification
FR-7951	355.22	Revised for clarity		X			Clarification
SR-7510	355.22	Revised for clarity		X			Clarification
	Article 356	**Liquidtight Flexible Nonmetallic Conduit: Type LFNC**					
FR-7952	356.2	Revised for clarity		X			Clarification
FR-7893	356.2	Revised for clarity		X			Clarification
FR-7894	356.10	Conductors or cables rated at a temperature rating of LFNC conduit shall be permitted to be installed in LFNC, provided the conductors or cables are not operated at a temperature higher than the listed temperature rating of the LFNC		X			Clarification
SR-7613							Clarification
FR-8004	356.10(1)	Revised for clarity		X			Clarification
FR-7998	356.10(2)	Revised for clarity		X			Clarification
FR-7895	356.22	Revised for clarity		X			Clarification
SR-7511	356.22	Revised for clarity		X			Clarification
SR-7615	356.30	Revised for clarity		X			Clarification
	Article 358	**Electrical Metallic Tubing: Type EMT**					
FR-7997	358.2	Revised for clarity		X			Clarification
FR-8084	358.10(D)	New Section: Clarifies that EMT can be used where subject to physical damage		X			Clarification
FR-8085	358.14	Stainless steel fittings are permitted to be used with galvanized steel EMT.		X			Clarification
FR-8086	358.22	Revised for clarity		X			Clarification
SR-7512	358.22	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
	Article 360	**Flexible Metallic Tubing: Type FMT**					
FR-7910	360.2	Revised for clarity		X			Clarification
FR-7912	360.22(A)	Revised for clarity		X			Clarification
SR-7513	360.22(A)	Revised for clarity		X			Clarification
	Article 362	**Electrical Nonmetallic Tubing: Type ENT**					
FR-7914	362.2	Revised for clarity		X			Clarification
FR-8001	362.10	Revised for clarity		X			Clarification
FR-7915	362.22	Revised for clarity		X			Clarification
SR-7514	362.22	Revised for clarity		X			Clarification
SR-7618	362.30(A)	Revised for clarity		X			Clarification
	Article 366	**Auxiliary Gutters**					
FR-8087	366.2	Revised for clarity		X			Clarification
FR-8088	366.22	Revised for clarity		X			Clarification
FR-8090	366.23	This revision also clarifies that the adjustment factor requirement in 366.23(A) shall only be applied where the number of current carrying conductors exceeds 30 at any cross section of the sheet metal auxiliary gutter.		X			Clarification
SR-7593	366.23	Revised for clarity		X			Clarification
	Article 368	**Busways**					
FR-8044	368.2	Revised for clarity		X			Clarification
FR-8055	368.17(A)	Revised for clarity		X			Clarification
FR-8052	368.56	Revised for clarity		X			Clarification
FR-8054	368.258	Revised for clarity		X			Clarification
FR-8058	368.320	Revised for clarity		X			Clarification
	Article 370	**Cablebus**					
FR-8056	370.2	Revised for clarity		X			Clarification
SR-7604	370.20(B)	Revised for clarity		X			Clarification
FR-8064	370.23	Revised for clarity		X			Clarification
FR-8063	370.80	Revised for clarity		X			Clarification
SR-7602	370.80	Revised for clarity		X			Clarification
	Article 372	**Cellular Concrete Floor Raceways**					
FR-8072	372.2	Revised for clarity		X			Clarification
FR-8073	372.18(D)	Revised for clarity		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
	Article 374	**Cellular Metal Floor Raceways**					
FR-8074	374.2	Revised for clarity		X			Clarification
FR-8092	374.6	New Section: Cellular metal floor raceways shall be listed.		X			Clarification
	Article 376	**Metal Wireways**					
FR-8078	376.2	Revised for clarity		X			Clarification
FR-8082	376.20	Revised for clarity		X			Clarification
SR-7620	376.20	Revised for clarity		X			Clarification
FR-8083	376.22(B)	Revised for clarity		X			Clarification
SR-7624	376.22(B)	Revised for clarity		X			Clarification
	Article 378	**Nonmetallic Wireways**					
FR-7897	378.2	Revised for clarity		X			Clarification
SR-7625	378.22	Revised for clarity		X			Clarification
	Article 380	**Multioutlet Assembly**					
FR-7903	380.12	Revised for clarity		X			Clarification
	Article 382	**Nonmetallic Extensions**					
FR-7696	382.2	Revised for clarity		X			Clarification
FR-7697	382.100	Revised for clarity		X			Clarification
FR-7699	382.104	Revised for clarity		X			Clarification
FR-7700	382.112	Revised for clarity		X			Clarification
	Article 384	**Strut-Type Channel Raceway**					
FR-8065	384.2	Revised for clarity		X			Clarification
SR-7626	384.22	Revised for clarity		X			Clarification
	Article 386	**Surface Metal Raceways**					
FR-8067	386.2	Revised for clarity		X			Clarification
SR-7627	386.22	Revised for clarity		X			Clarification
	Article 388	**Surface Nonmetallic Raceways**					
FR-8068	388.2	Revised for clarity		X			Clarification
	Article 390	**Underfloor Raceways**					
FR-8094	390	Revised for clarity		X			Clarification
SR-7630	390.23	Revised for clarity		X			Clarification
	Article 392	**Cable Trays**					
FR-7936	392.1	Revised for clarity		X			Clarification
SR-7535	392.1	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7937	392.2	Revised for clarity		X			Clarification
FR-8011	392.3(4)	Revised for clarity		X			Clarification
FR-7940	392.10	clarifies the use of single conductors in cable trays.		X			Clarification
FR-7941	392.10(B)	Revised for clarity		X			Clarification
FR-8009	392.10(B)(1)(b)	Revised for clarity		X			Clarification
FR-7945	392.18(H)	Revised for clarity		X			Clarification
FR-8010	392.30(B)	Multiconductor cables were added to 392.30(B) where transitioning from cable tray to another cable tray or raceway		X			Clarification
SR-7540							Clarification
FR-7964	392.44	New Section: Expansion Splice Plates.		X			Clarification
SR-7543							Clarification
FR-8013	392.46	revised to clarify a compliant application for conductors and cables to transition from the cable tray to raceways or to enter into enclosures		X			Clarification
SR-7544	392.46(A), 392.46(B)	Revised for clarity		X			Clarification
FR-7966	392.60(A)	Revised for clarity		X			Clarification
SR-7546	392.60(A), 392.60(B)	Revised for clarity		X			Clarification
FR-8015	392.80(A)	Revised for clarity		X			Clarification
FR-8017	392.80(A)(1)	Revised for clarity		X			Clarification
SR-7552	392.80(A)(1)	Revised for clarity		X			Clarification
SR-7554	392.80(A)(2)	Revised for clarity		X			Clarification
FR-8018	392.80(B)	Revised for clarity		X			Clarification
FR-8019	392.80(B)(1)	Revised for clarity		X			Clarification
SR-7558	392.80(B)(1)	Revised for clarity		X			Clarification
SR-7556	392.80(B)(2)	Revised for clarity		X			Clarification
	Article 393	**Low-Voltage Suspended Ceiling Power Distribution Systems**					
FR-8133	393.2	Revised for clarity		X			Clarification
FR-8134	393.10	Revised for clarity		X			Clarification
FR-8135	393.14(A)	Revised for clarity		X			Clarification
FR-8136	393.40(A)	Revised for clarity		X			Clarification
	Article 394	**Concealed Knob-and-Tube Wiring**					

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7701	394.2	Revised for clarity		X			Clarification
	Article 396	**Messenger-Supported Wiring**					
FR-7702	396.2	Revised for clarity		X			Clarification
	Article 398	**Open Wiring on Insulators**					
FR-7704	398.2	Revised for clarity		X			Clarification
	Article 399	**Outdoor Overhead Conductors over 1000 Volts**					
FR-7711	399.10	Revised for clarity		X			Clarification
FR-7710	399.2	Revised for clarity		X			Clarification
FR-7712	399.30(B)	Revised for clarity		X			Clarification
	CHAPTER 4	**EQUIPMENT FOR GENERAL USE**					
	Article 400	**Flexible Cords and Flexible Cables**					
FR-7911	400.1	The Informational note is appropriately located under 400.12 and was revised for clarity.					Clarification
FR-7917	400.4	Table updated to include new outdoor heater cable type					Clarification
FR-7901	400.5(A)	Revised for clarity		X			Clarification
SR-7732	400.12	Revised for clarity		X			Clarification
FR-7907	400.12	Revised for clarity		X			Clarification
FR-7931	400.17	Revised for clarity		X			Clarification
FR-7932	400.23	Revised for clarity		X			Clarification
	Article 402	**Fixture Wires**					
FR-7982	402.3	Revision					Clarification
FR-7978	402.5	Revision					Clarification
	Article 404	**Switches**					
FR-7607	404.1	Revised for clarity		X			Clarification
FR-7611	404.2(C)	Revised for clarity		X			Clarification
SR-8166	404.2(C)	Revised for clarity		X			Clarification
FR-7613	404.4(C)	Revised for clarity		X			Clarification
FR-7621	404.7	Switches and circuit breakers must clearly indicate whether they are in the open or closed position. this indication must be visible without opening the enclosure to see the open/closed indication		X			Safety

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7671	404.9	Topics covered need to apply equally to dimmer switches and other switches with comparable control functions such as occupancy sensors that are located in similar environments.		X			Clarification
SR-8168	404.9(B)	Revised for clarity		X			Clarification
FR-7634	404.10	Topics covered need to apply equally to dimmer switches and other switches with comparable control functions such as occupancy sensors that are located in similar environments.		X			Clarification
FR-7642	404.12	Revised for clarity		X			Clarification
FR-7674	404.14	Requires switches to be listed, and modernizes the rules for ac or dc general-use snap switches by adding coverage of electronic ballasts, self-ballasted lamps, compact fluorescent lamps, and LED lamps with their associated drivers.		X			Clarification
SR-8170							Clarification
SCR-32							Clarification
FR-7646	404.22	Revised for clarity		X			Clarification
	Article 406	**Receptacles, Cord Connectors, and Attachment Plugs (Caps)**					
FR-8241	406	Revised for clarity		X			Clarification
FR-8250	406.1	Revised for clarity		X			Clarification
FR-8254	406.2	Revised for clarity		X			Clarification
SR-8187	406.3(A)	Receptacles shall not be permitted to be reconditioned		X			Clarification
FR-8257	406.3(D)	Revised for clarity		X			Clarification
FR-8386	406.4(A)	Revised for clarity		X			Clarification
FR-8297	406.4(C)	Revised for clarity		X			Clarification
FR-8314	406.4(D)(3)	Revised for clarity		X			Clarification
SR-8204	406.4(D)(3)	Revised for clarity		X			Clarification
FR-8302	406.4(D)(4)	Revised for clarity		X			Clarification
FR-8319	406.4(D)(7)	New Section: The new text addresses the replacement of controlled receptacles. It addresses safety concerns related to the removal of the control feature.		X			Clarification
SR-8211	406.4(D)(7)	Revised for clarity		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8336	406.5(G)	A receptacle outlet installed in the area beneath a sink should not be installed in a face-up position, which could allow water or other objects to enter the receptacle.		X			Clarification
SR-8189	406.7	wiring devices are not recommended for reconditioning.		X			Clarification
FR-8345	406.9(A), 406.9(B)	Revised for clarity		X			Clarification
FR-8350	406.9(C)	Defines the a zone measured 900 mm (3 ft) horizontally and 2.5 m (8 ft) vertically from the top of the bathtub rim where a receptacle cannot be installed.		X			Safety
SR-8214	406.9(C)	Revised for clarity		X			Clarification
FR-8357	406.10	Revised for clarity		X			Clarification
FR-8368	406.12	Clarifies areas that require tamper proof receptacles		X			Clarification
FR-8378	406.13	New Section: Single pole separable connectors		X			Safety
	Article 408	**Switchboards, Switchgear, and Panelboards**					
FR-7655	408.3(A)	Barrier requirements relocated to article 230		X			Clarification
FR-7764	408.3(D)	Barrier requirements relocated to article 230		X			Clarification
FR-7661	408.4(A)	Revised for clarity		X			Clarification
FR-7663 SR-8171	408.6	New Section: The available short-circuit current and the date the calculation was performed shall be documented and made available to those authorized to inspect the installation. Exception for 1 and 2 family dwellings			X	$40/ panel	Safety
SR-8172	408.8	New Section: Panelboards cannot be reconditioned. Switchboards can be reconditioned. Label must be replaced to indicate the equipment is reconditioned.		X			Clarification
FR-7675 SR-8180	408.18(C)	New Section: Special instructions for gear requiring the installed to reach across bus bars to make connections.		X			Clarification Clarification

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			Decrease	None	Increase		
Sub Code:							
FR-7659	408.23	New Section: rules to allow power monitoring equipment in a switchboard		X			Clarification
SR-8185	408.36	Revised for clarity		X			Clarification
SR-8186	408.40	Revised for clarity		X			Clarification
SR-8240	408.43	New Section: Panelboards shall not be installed in the face-up position.		X			Clarification
FR-7693	408.56	Revised for clarity		X			Clarification
SR-8188	408.56	Revised for clarity		X			Clarification
SCR-11	408.56	Revised for clarity		X			Clarification
	Article 409	**Industrial Control Panels**					
FR-7900	409.22(A), 409.22(B)	Revised for clarity		X			Clarification
	Article 410	**Luminaires, Lampholders, and Lamps**					
FR-8388	410.2	Revised for clarity		X			Clarification
SR-8162	410.6	Luminaires, lampholders, and retrofit kits shall not be permitted to be reconditioned		X			Clarification
FR-8394	410.10(D)	Revised for clarity		X			Clarification
FR-8400	410.16	Revised for clarity		X			Clarification
FR-8406	410.22	Revised for clarity		X			Clarification
FR-8418	410.36(A)	Revised for clarity		X			Clarification
SR-8169	410.36(A)	Revised for clarity		X			Clarification
SR-8173	410.40	Revised for clarity		X			Clarification
FR-8426	410.42	Revised for clarity		X			Clarification
SR-8225	410.42	Revised for clarity		X			Clarification
FR-8430	410.44	Revised for clarity		X			Clarification
FR-8433	410.46	Section deleted in first draft		X			Clarification
SR-8174	410.46	Section returned in second draft		X			Clarification
FR-8479	410.52	Section deleted in first draft		X			Clarification
SR-8175	410.52	Section returned in second draft		X			Clarification
FR-8480	410.54	Section deleted in first draft		X			Clarification
SR-8183	410.54	Section returned in second draft		X			Clarification
FR-8482	410.62(C)(1)	Revised for clarity		X			Clarification
FR-8512 SR-8179	410.69	New Section: Require a different color for lighting control wires		X			Safety
FR-8390	410.70	Section deleted in first draft		X			Clarification

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			Decrease	None	Increase		
Sub Code:							
SR-8177	410.70	Section returned in second draft		X			Clarification
FR-8505	410.82	Section deleted in first draft		X			Clarification
SR-8181	410.82	Section returned in second draft		X			Clarification
FR-8515	410.115(B)	Added listing requirement for luminaires installed in fire rated installations.		X			Safety
FR-8412	410.118	Luminaires cannot be used to access a junction box not related to the luminaire		X			Safety
FR-8529	410.136(B)	Revision		X			Clarification
SR-8182	410.136(B)	Revised for clarity		X			Clarification
FR-8542	410.137(C)	Updated to include provisions for LEDs		X			Clarification
FR-8530	410.141(B)	Revision		X			Clarification
FR-8537	Part XVI	New Part XVI. Special Provisions for Horticultural Lighting Equipment		X			Safety
SR-8167	410.184	Revised for clarity		X			Clarification
	Article 411	**Low-Voltage Lighting**					
SR-8164	411.4	Listed low-voltage lighting cannot be reconditioned		X			Clarification
SR-8242	411.4(B)	Revised for clarity		X			Clarification
FR-8138	411.6(D)	Delete redundant material		X			Clarification
	Article 422	**Appliances**					
SR-8124	422.5(A)	Revised for clarity		X			Clarification
FR-8164	422.5(B)	Revised for clarity		X			Clarification
FR-8143	422.5(A)	Added sump pumps and bottle fill stations to GFCI requirements			X	$50/ device	Safety
FR-8176	422.6	Revised for clarity		X			Clarification
SR-7868	422.6	Revised for clarity		X			Clarification
FR-8287	422.10	Revised for clarity		X			Clarification
FR-8188	422.11(F)(1)	Revised for clarity		X			Clarification
SR-7869	422.13	Revised for clarity		X			Clarification
FR-8282	422.16(A)	Revised for clarity		X			Clarification
SR-7872	422.16(A)	Revised for clarity		X			Clarification
FR-8283	422.16(B)(1)	Revised for clarity		X			Clarification
FR-8284	422.16(B)(2)	Revised for clarity		X			Clarification
FR-8285	422.16(B)(3)	Revised for clarity		X			Clarification
FR-8286	422.16(B)(4)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7875	422.16(B)	Revised for clarity		X			Clarification
SR-7880	422.17	Revised for clarity		X			Clarification
SCR-49	422.17	Revised for clarity		X			Clarification
FR-8235	422.19	Revised for clarity		X			Clarification
FR-8237	422.21	New Section		X			Clarification
FR-8243	422.31(A)	Revised for clarity		X			Clarification
FR-8245	422.31(B)	Revised for clarity		X			Clarification
FR-8224	422 Parts IV & V	Sections deleted in first draft		X			Clarification
SR-7900	422 Parts IV & V	Sections returned in second draft		X			Clarification
	Article 424	**Fixed Electric Space-Heating Equipment**					
FR-8300	424.1	Revised for clarity		X			Clarification
SR-7970	424.1	Revised for clarity		X			Clarification
FR-8303	424.2	Revised for clarity		X			Clarification
SR-7976	424.2	Revised for clarity		X			Clarification
FR-8318	424.3	Revised for clarity		X			Clarification
FR-8308	424.3(B)	Revised for clarity		X			Clarification
SR-7977	424.4(A)	Revised for clarity		X			Clarification
SR-7985	424.4(B)	Revised for clarity		X			Clarification
FR-8312	424.9	Revised for clarity		X			Clarification
FR-8301	424.10	Revised for clarity		X			Clarification
SR-7986	424.10	Revised for clarity		X			Clarification
FR-8320	424.11	Revised for clarity		X			Clarification
FR-8324	424.19	Revised for clarity		X			Clarification
FR-8329	424.19(A)(1)	Revised for clarity		X			Clarification
FR-8343	424.19(A)(2)	Revised for clarity		X			Clarification
FR-8346	424.19(B)(1)	Revised for clarity		X			Clarification
FR-8353	424.19(C)(1)	Revised for clarity		X			Clarification
FR-8354	424.19(C)(2)	Revised for clarity		X			Clarification
FR-8372	424.20(A)	Thermostats acting also as a disconnect must be installed in an accessible location		X			Clarification
SR-7988	424.20(A)	Revised for clarity		X			Clarification
FR-8379	424.22(A)	Revised for clarity		X			Clarification
SR-7997	424.22(A)	Revised for clarity		X			Clarification
SR-8006	424.22(C)	Revised for clarity		X			Clarification
FR-8387	424.28(B)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8405	424.36	Revised for clarity		X			Clarification
SR-8010	424.36	Revised for clarity		X			Clarification
SCR-51	424.36	Revised for clarity		X			Clarification
FR-8409	424.38(A)	Revised for clarity		X			Clarification
FR-8416	424.38(C)	Revised for clarity		X			Clarification
FR-8421	424.39	Revised for clarity		X			Clarification
FR-8428	424.41(J)	Revised for clarity		X			Clarification
FR-8431	424.43(A)	Revised for clarity		X			Clarification
SR-8012	424.44(E)	Revised for clarity		X			Clarification
SCR-54	424.44(E)	Revised for clarity		X			Clarification
FR-8432	424.45(C)	Revised for clarity		X			Clarification
FR-8436	424.45(D)	Revised for clarity		X			Clarification
SR-8013	424.45(D)	Revised for clarity		X			Clarification
SR-8014	424.45(E)	Revised for clarity		X			Clarification
FR-8443	424.46	Revised for clarity		X			Clarification
FR-8446	424.65	Revised for clarity		X			Clarification
FR-8447	424.66	Controls also now specified to be accessible.		X			Clarification
FR-8488	424.72(D)	Revised for clarity		X			Clarification
FR-8494	424.85	Revised for clarity		X			Clarification
FR-8495	424.86	Revised for clarity		X			Clarification
FR-8497	424.91	Revised for clarity		X			Clarification
FR-8499	424.93(A)(3)	Revised for clarity		X			Clarification
SR-8016	424.94	Revised for clarity		X			Clarification
SCR-55	424.94	Revised for clarity		X			Clarification
FR-8500	424.94	Revised for clarity		X			Clarification
SR-7854	424.95	Revised for clarity		X			Clarification
SCR-56	424.95	Revised for clarity		X			Clarification
FR-8502	424.97	Revised for clarity		X			Clarification
FR-8507	424.99(B)	Revised for clarity		X			Clarification
FR-8508	424.99(B)(4)	Revised for clarity		X			Clarification
SR-8017	424.99(B)(5)	Revised for clarity		X			Clarification
	Article 425	**Fixed Resistance and Electrode Industrial Process Heating Equipment**					
FR-8533	425.1	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7942	425.1	Revised for clarity		X			Clarification
SCR-57	425.1	Revised for clarity		X			Clarification
FR-8538	425.2	Revised for clarity		X			Clarification
FR-8540	425.3	Revised for clarity		X			Clarification
SR-8018	425.4(A)	Revised for clarity		X			Clarification
FR-8539	425.9	Revised for clarity		X			Clarification
FR-8541	425.19	Revised for clarity		X			Clarification
FR-8543	425.19(A)(1)	Revised for clarity		X			Clarification
FR-8594	425.19(A)(2)	Revised for clarity		X			Clarification
FR-8544	425.19(B)(1)	Revised for clarity		X			Clarification
FR-8545	425.19(B)(2)	Revised for clarity		X			Clarification
FR-8547	425.22(B)	Revised for clarity		X			Clarification
FR-8571	425.22(D)	Revised for clarity		X			Clarification
FR-8558	425.28(A)	Revised for clarity		X			Clarification
FR-8560	425.28(B)	Nameplate must be permanently installed		X			Clarification
SR-7945	425.28(B)	Revised for clarity		X			Clarification
FR-8562	425.29	Revised for clarity		X			Clarification
FR-8564	425.45	Revised for clarity		X			Clarification
FR-8567	425.64	Revised for clarity		X			Clarification
SR-7946	425.64	Revised for clarity		X			Clarification
FR-8535	425.8(A)	Revised for clarity		X			Clarification
FR-8570	425.82	Revised for clarity		X			Clarification
SR-7948	425.82	Revised for clarity		X			Clarification
FR-8572	425.85	Revised for clarity		X			Clarification
FR-8574	425.86	Revised for clarity		X			Clarification
	Article 426	**Fixed Outdoor Electric Deicing and Snow-Melting Equipment**					
FR-8578	426.1	Revised for clarity		X			Clarification
SR-7911	426.2	Revised for clarity		X			Clarification
FR-8583	426.10	Revised for clarity		X			Clarification
SR-7926	426.20	Replace all instances of " masonry or asphalt" with "concrete, masonry or asphalt" in the following sections.		X			Clarification
FR-8618	426.20(C)	Revised for clarity		X			Clarification
FR-8587	426.21(A)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
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			Decrease	None	Increase		
Sub Code:							
FR-8606	426.22	To improve the overall safety of the system, the non-heating leads are now required to have a continuous grounding sheath or braid. The revisions ensure a complete ground path.		X			Clarification
SR-7915	426.22	Revised for clarity		X			Clarification
SR-7939	426.34	Revised for clarity		X			Clarification
SR-7855	426.40	Revised for clarity		X			Clarification
FR-8614	426.44	Revised for clarity		X			Clarification
SR-7934	426.44	Revised for clarity		X			Clarification
FR-8615	426.51(A)	Revised for clarity		X			Clarification
FR-8616	426.51(D)	Revised for clarity		X			Clarification
	Article 427	**Fixed Electric Heating Equipment for Pipelines and Vessels**					
FR-8252	427.1	Revised for clarity		X			Clarification
FR-8258	427.2	Revised for clarity		X			Clarification
FR-8265	427.15	Revised for clarity		X			Clarification
FR-8259	427.20	Revised for clarity		X			Clarification
FR-8268	427.23	The revision clarifies the ground-fault protection requirements. The ground conductor is not required to carry the full fault current.		X			Clarification
SR-7857	427.45	Revised for clarity		X			Clarification
FR-8296	427.57	Revised for clarity		X			Clarification
	Article 430	**Motors, Motor Circuits, and Controllers**					
FR-7942	430 & 440	Revised for clarity		X			Clarification
FR-7960	430.2	Revised for clarity		X			Clarification
FR-7967	430.6	Revised for clarity		X			Clarification
FR-8024	430.7(A)	Added an entry for "Electronically Protected Motors"		X			Clarification
FR-7970	430.26	Revised for clarity		X			Clarification
SR-7565	430.26	Revised for clarity		X			Clarification
FR-8027	430.32(A)(2)	Added an entry for "Electronically Protected Motors"		X			Clarification
FR-8028	430.32(B)(2)	Added an entry for "Electronically Protected Motors"		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
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			Decrease	None	Increase		
Sub Code:							
FR-7972	430.52(C)(3)	Added an entry for "Electronically Protected Motors"		X			Clarification
SR-7609	430.96	Revised for clarity		X			Clarification
SCR-35	430.96	Revised for clarity		X			Clarification
SR-7603	430.98(A)	Revised for clarity		X			Clarification
FR-7975	430.99	Revised for clarity		X			Clarification
SR-7597	430.122(A)	New informational note on adjustable speed drives		X			Clarification
FR-8000	430.122(B)	New section adjustable speed drives		X			Clarification
SR-7641	430.122(B)	New section adjustable speed drives		X			Clarification
FR-7989	430.122(D)	Clarifies the load for multiple motors and other loads		X			Clarification
SR-7688	430.122(D)	Revised for clarity		X			Clarification
FR-7999	430.130(A)	Revised for clarity		X			Clarification
SR-7677	430.130(A)	Revised for clarity		X			Clarification
SCR-76	430.246	Delete Section		X			Clarification
SR-7658	430.246, Table 430.252	New table based on 250.122		X			Clarification
	Article 440	**Air-Conditioning and Refrigerating Equipment**					
FR-7918	440.2	Revised for clarity		X			Clarification
FR-7925	440.9	Revised for clarity		X			Clarification
FR-7927	440.10(A)	Revised for clarity		X			Clarification
FR-7939	440.10(B)	Revised for clarity		X			Clarification
SR-7691	440.32	Revised for clarity		X			Clarification
	Article 445	**Generators**					
SR-7639	445.6	Require stationary generators under 600V to be listed		X			Safety
FR-7720	445.11	Revised for clarity		X			Clarification
SR-7640	445.11	Revised for clarity		X			Clarification
FR-8874	445.18	Added definition for "remote shutdown switch"		X			Clarification
SR-7645	445.18	Added definition for "remote shutdown switch"		X			Clarification
FR-7770	445.18(A)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7846	445.18(D)	adds requirements for a means to shutdown the prime mover of other than cord and plug connected generators in one and two family dwellings.			X	$500	Clarification
	Article 450	**Transformers and Transformer Vaults (Including Secondary Ties)**					
SR-8191	450.2	Revised for clarity		X			Clarification
FR-7772	450.6(A)(1)	Revised for clarity		X			Clarification
FR-7773	450.6(A)(2)	Revised for clarity		X			Clarification
FR-7774	450.9	Revised for clarity		X			Clarification
SR-8197	450.9	Revised for clarity		X			Clarification
FR-7767	450.10(B)	Revised for clarity		X			Clarification
FR-7768	450.14	Revised for clarity		X			Clarification
FR-7782	450.21(B)	Revised for clarity		X			Clarification
SR-8201	450.21(B)	Revised for clarity		X			Clarification
FR-7788	450.23(A)	Revised for clarity		X			Clarification
SR-8203	450.23(A), 450.23(B)	Revised for clarity		X			Clarification
SCR-12	450.23(A), 450.23(B)	Revised for clarity		X			Clarification
FR-7783	450.27	Revised for clarity		X			Clarification
FR-7784	450.42	Revised for clarity		X			Clarification
SR-8205	450.42	Revised for clarity		X			Clarification
FR-7785	450.43(C)	Revised for clarity		X			Clarification
FR-7787	450.45(E)	Revised for clarity		X			Clarification
	Article 455	**Phase Converters**					
FR-7775	455.2	Revised for clarity		X			Clarification
	Article 460	**Capacitors**					
FR-7909	460.1	New Definition for "Safe Zone"		X			Clarification
FR-8582	462.2	Revised for clarity		X			Clarification
FR-7913	460.25(D)	Removed references to "Zone 1 and Zone2" in lieu of new definition for "Safe Zone"		X			Clarification
	Article 480	**Storage Batteries**					

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8979	480	Sections 706.30, 31, 32, 33, and 34 (energy storage systems) will be removed entirely. Some of the information is moved to 480		X			Clarification
SR-7708	480.1	Revised for clarity		X			Clarification
FR-8875	480.2	Revised for clarity		X			Clarification
FR-8089	480.7	For one-family and two-family dwellings, a disconnecting means or its remote control for a stationary battery system shall be located at a readily accessible location outside the building for emergency use. The disconnect shall be labeled “EMERGENCY DISCONNECT”.			X	500	Clarification
SR-7721							Clarification
SR-7735	480.10	Revised for clarity		X			Clarification
SR-7719	480.10(C)	Revised for clarity		X			Clarification
SR-7714	480.10(E)	Revised for clarity		X			Clarification
	Article 490	**Equipment Over 1000 Volts, Nominal**		X			
FR-7795	490.1	Revised for clarity		X			Clarification
SR-8207	490.2	Revised for clarity		X			Clarification
FR-7827	490.21(A)	Retrofit trip units shall be listed for use with the specific circuit breaker with which it is installed.		X			Safety
SR-8212	490.21(A)(4)	Revised for clarity		X			Clarification
SR-8215	490.21(B)(2)	Revised for clarity		X			Clarification
SR-8216	490.21(C)(3)	Revised for clarity		X			Clarification
SR-8217	490.21(D)(2)	Revised for clarity		X			Clarification
FR-7805	490.21(E)	Revised for clarity		X			Clarification
SR-8219	490.21(E)	Revised for clarity		X			Clarification
SR-8220	490.25	Revised for clarity		X			Clarification
FR-7811	490.35(B)	The revised wording clarifies the requirement and provides the expected level of safety that was originally intended.		X			Safety
FR-7823	490.44(C)	Revised for clarity		X			Clarification
FR-7824	490.46	Revised for clarity		X			Clarification
FR-7836	490.48(B)	Revision		X			Clarification
SR-8222	490.49	Clarifies the condition under which medium voltage switchgear can be reconditioned		X			Safety

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
	CHAPTER 5	**SPECIAL OCCUPANCIES**					Clarification
	Article 500	**Hazardous (Classified) Locations, Classes I, II, and III, Divisions 1 and 2**					
FR-7778	500	Revised for clarity		X			Clarification
SR-7852	500.4	Revised for clarity		X			Clarification
FR-7851	500.4(B)	Revised for clarity		X			Clarification
FR-7506	500.5(A)	Revised for clarity		X			Clarification
SR-7895	500.5(A)	Revised for clarity		X			Clarification
FR-7522	500.5(C)(1)	Revised for clarity		X			Clarification
FR-7510	500.6	Revised for clarity		X			Clarification
FR-7865	500.7	Revised for clarity		X			Clarification
SR-7917	500.7	Revised for clarity		X			Clarification
SR-8082	500.7(K)	Revised for clarity		X			Clarification
FR-7723	500.7(K)	Added sufficient detail to install and operate the gas detection system in order to adequately function as an equipment protection technique		X			Safety
FR-7867	500.7(L)	New Section: types of protection for optical radiation have been added		X			Safety
SR-8086	500.7(O)	New Section: The protection method for skin effect trace heating has been added		X			Safety
FR-7514	500.8(E)(1), 500.8(E)(2)	Revision		X			Clarification
FR-7869	500.8(F)	New Section: This equipment revision for optical radiation has been added		X			Safety
SR-7918	500.8(G)	Revised for clarity		X			Clarification
	Article 501	**Class I Locations**					
SR-7962	501.10(A)(1)	Revised for clarity		X			Clarification
FR-7609	501.10(A)(1)	Revised for clarity		X			Clarification
FR-7565	501.10(A)(1)(6)	adds TypeTC-ER-HL cable as a general wiring method in Class I, Division 1 or Zone 1 locations		X			Clarification
FR-7596	501.10(A)(1)(7)	Adds Type P cable		X			Clarification
SR-7979	501.10(A)(1)(3)	Revised for clarity		X			Clarification
SR-7963	501.10(A)(2)	Revised for clarity		X			Clarification
FR-7594	501.10(A)(2)	Revised for clarity		X			Clarification

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			Decrease	None	Increase		
Sub Code:							
FR-7605	501.10(A)(2)(4)	New Section: allows type P cable in restricted situations		X			Clarification
FR-7532	501.10(A)(3)	Revised for clarity		X			Clarification
SR-8007	501.10(B)(1)	An additional sentence was added because the drain wire cannot serve as the EGC as it is not connected at both ends.		X			Safety
FR-7569	501.10.(A)(1)(3)	adds Type MC-HL cable with interlocked metallic sheath		X			Options
FR-7620	501.10(B)(1)	The Panel affirms the need for an equipment grounding conductor in Hazardous Locations. A drain wire connected at only one end cannot serve this purpose.		X			Safety
FR-7577	501.10(B)(1)(1)	Revised for clarity		X			Clarification
FR-7572	501.10(B)(1)(6)	Clarifies the use of PVC coated RMC and IMC in corrosive environments		X			Clarification
FR-7616	501.10(B)(1)(9)	adds Type P cable with or without metal braid armor		X			New cable type
FR-7533	501.10(B)(4)	Revised for clarity		X			Clarification
FR-7623	501.15(A)(1)	Revised for clarity		X			Clarification
FR-7652	501.15(D)(1)	Revised for clarity		X			Clarification
FR-7630	501.17	Revised for clarity		X			Clarification
FR-7632	501.105(B)(6)	Revised for clarity		X			Clarification
FR-7636	501.130(B)(5)	Revised for clarity		X			Clarification
FR-7638	501.135(B)(1)	adds reference to skin-effect trace heating		X			Clarification
	Article 502	**Class II Locations**					
FR-7645	502.10(A)(1)	New wiring methods have been added to this section.		X			Clarification
SR-7932	502.10(A)(1)	Revised for clarity		X			Clarification
SCR-37	502.10(A)(1)	Revised for clarity		X			Clarification
FR-7725	502.10(A)(1)(6)	adds Type TC-ER-HL cable as a general wiring method		X			New cable type
FR-7726	502.10(A)(1)(7)	adds Type P cable, having metal braid armor, as a general wiring method in Class II, Division 1 locations		X			New cable type
SR-7937	502.10(A)(2)	Revised for clarity		X			Clarification

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			Decrease	None	Increase		
Sub Code:							
FR-7727	502.10(A)(2)	additional options which have the potential to provide a number of benefits over the currently allowed methods		X			Clarification
FR-7728	502.10(A)(2)(8)	adds Type P cable having metal braid armor as a flexible wiring method in Class II Division 1		X			Clarification
FR-7660	502.10(A)(3)	Revised for clarity		X			Clarification
SR-7943	502.10(B)(1)	the drain wire cannot serve as the EGC		X			Clarification
FR-7668	502.10(B)(1)	The acceptable wiring methods have been reorganized to clarify the requirements.		X			Clarification
FR-7673	502.10(B)(1)(10)	adds Type P cable with or without metal braid armor		X			Clarification
FR-7724	502.10(B)(7)	Where the corrosion resistance of metal conduit is not sufficient, the Panel affirms the use of RTRC-XW, PVC coated RMC and IMC shall be allowed.		X			Clarification
FR-7858	502.150(B)(5)	New Section: process control instruments shall be permitted to be connected through flexible cord, attachment plug, and receptacle,		X			Clarification
	Article 503	**Class III Locations**					
FR-7678	503.5	The current certification standards do not require dust blanketing for Class III evaluation		X			Clarification
FR-7681	503.10(A)(1)	affirms the need for an equipment grounding conductor in Hazardous Locations		X			Clarification
SR-8021	503.10(A)(1)	The drain wire cannot serve as the EGC		X			Clarification
SR-8024	503.10(A)(3)	Revised for clarity		X			Clarification
	Article 505	**Zone 0, 1, and 2 Locations**					
FR-7789	505	Revised for clarity		X			Clarification
SR-8123	505.3	Revised for clarity		X			Clarification
SR-8035	505.4	Revised for clarity		X			Clarification
FR-7792	505.4(A)	Revised for clarity		X			Clarification
FR-7794	505.4(B)	Revised for clarity		X			Clarification
FR-7796	505.5(A)	Revised for clarity		X			Clarification
SR-8040	505.5(A)	Revised for clarity		X			Clarification

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			Decrease	None	Increase		
Sub Code:							
SR-8041	505.5(B)(1)	Revised for clarity		X			Clarification
FR-7797	505.6	Revised for clarity		X			Clarification
FR-7806	505.7(B)	Revised for clarity		X			Clarification
FR-7798	505.7(F)	Revised for clarity		X			Clarification
FR-7799	505.8	Revised for clarity		X			Clarification
SR-8043	505.8	Revised for clarity		X			Clarification
FR-7801	505.8(A), 505.8(B)	Revised for clarity		X			Clarification
FR-7804	505.8(C)	Revised for clarity		X			Clarification
FR-7809	505.8(E)	Revised for clarity		X			Clarification
FR-7884	505.8(F), 505.8(G), 505.8(H)	Revised for clarity		X			Clarification
FR-7821	505.8(I)	Revised for clarity		X			Clarification
FR-7812	505.8(J)	New Section: A new product standard has been introduced for the examination, testing, and marking of electrical resistance trace heating.		X			Clarification
FR-7875	505.8(K) - (L)	New Section: types of protection for optical radiation have been added		X			Clarification
FR-7831	505.9	Revised for clarity		X			Clarification
SR-8054	505.9(C)(2)	revised to allow marking for skin effect trace heating systems		X			Clarification
FR-7878	505.9(G)	revision for optical radiation has been added		X			Clarification
SR-8051	505.9(G)	Revised for clarity		X			Clarification
SR-8026	505.15(B)(1)	Revised for clarity		X			Clarification
FR-7837	505.15(B)(1)	New permitted cable types have been added to this section.		X			New cable type
FR-7835	505.15(B)(1)(10)	added Type P cable having metal braid armor as a flexible wiring method		X			New cable type
FR-7834	505.15(B)(1)(9)	Removes the arbitrary 1 inch diameter restriction previously placed on the use of TC-ER-HL cable		X			Options
FR-7840	505.15(B)(2)	adds the ability to use Type P or Types TC-ER-HL cables for flexible connections		X			New cable type

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-8028	505.15(B)(2)	Revised for clarity		X			Clarification
FR-7842	505.15(C)(1)	affirms that a separate insulated equipment grounding conductor is necessary for hazardous (classified) locations and the drain wire that is not connected at both ends cannot serve this purpose		X			Clarification
SR-8031	505.15(C)(1)	affirms that all "-ER" cable constructions used in a hazardous (classified) locations must include an equipment grounding conductor and the drain or shield conductor may not be used for that purpose		X			Clarification
FR-7843	505.15(C)(2)	adds the ability to use Type P or Types TC cables for flexible connections		X			Clarification
FR-7845	505.16(B)(1)	Revised for clarity		X			Clarification
FR-7653	505.16(B)(2)	Revised for clarity		X			Clarification
FR-7780	505.16(C)(2)	Revised for clarity		X			Clarification
FR-7848	505.19	Revised for clarity		X			Clarification
FR-7847	505.26	Revised for clarity		X			Clarification
	Article 506	**Zone 20, 21, and 22 Locations for Combustible Dusts or Ignitible Fibers/Flyings**					
FR-7733	506	Revised for clarity		X			Clarification
SR-8058	506.1	Revised for clarity		X			Clarification
FR-8102	506.2	Relocate definition of Protection to Article 100		X			Clarification
SR-8075	506.4	Revised for clarity		X			Clarification
FR-7690	506.4(B)	Revised for clarity		X			Clarification
FR-7734	506.5(B)(1), 506.5(B)(2), 506.5(B)(3)	language has been added due to the high risk of explosion of Group IIIC materials		X			Safety
SR-8076	506.8	Revised for clarity		X			Clarification
FR-7692	506.8(H)	Revised for clarity		X			Clarification
FR-7694	506.8(I)	Revised for clarity		X			Clarification
FR-7695	506.8(J)	New Section: The US adoption of IEC/IEEE 60079-30-1, ANSI/UL 60079-30-1 has changed the way Electrical Resistance Trace Heaters are marked.		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7880	506.8(K) - (M)	New Section: These types of protection revisions for optical radiation have been added		X			Clarification
FR-7703	506.9(C)(2)	Revised Table 506.9(C)(2)(3) Equipment Suitability		X			Clarification
SR-8077	506.9(C)(2)	Revised for clarity		X			Clarification
FR-7882	506.9(G)	New Section: This equipment revision for optical radiation has been added		X			Clarification
SR-8081	506.9(G)	Revised for clarity		X			Clarification
SR-8064	506.15	Revised for clarity		X			Clarification
FR-7735	506.15(A)	Revised for clarity		X			Clarification
FR-7736	506.15(B)	Revised for clarity		X			Clarification
FR-7707	506.15(C)	Revised for clarity		X			Clarification
FR-7737	506.17	Revised for clarity		X			Clarification
	Article 511	**Commercial Garages, Repair and Storage**					Clarification
FR-7738	511.8	Revised for clarity		X			Clarification
FR-7739	511.12	This revision provides alignment of 511.12 with 210.8(B) for GFCIs.		X			Clarification
	Article 513	**Aircraft Hangars**					Clarification
SR-8093	513.3(C)(2)	Revised for clarity		X			Clarification
FR-7740	513.3(D)	Revised for clarity		X			Clarification
FR-7742	513.12	affirms that the ground fault protection requirements of 210.8(B) should apply.		X			Clarification
SR-8094	513.16(A)	Revised for clarity		X			Clarification
SR-8096	513.16(B)	Revised for clarity		X			Clarification
	Article 514	**Motor Fuel Dispensing Facilities**					
FR-7743	514.11(A)	The grounded conductor should be disconnected simultaneously with all of the other conductors when the emergency disconnect is activated. It should also be clear that the equipment grounding conductors should not be disconnected.		X			Safety
	Article 515	**Bulk Storage Plants**					
FR-7744	515.3	The title change from “Class I Locations” to “Classified Locations” is an improvement to correlate with Article 505.		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-8100	515.16	Revised for clarity		X			Clarification
	Article 517	**Health Care Facilities**					
FR-8788	517	Revised for clarity		X			Clarification
FR-8795	517	updates the extracted text from NFPA 99 and NFPA 101		X			Clarification
FR-8699	517.1	Revised for clarity		X			Clarification
FR-8655	517.2	Revised for clarity		X			Clarification
SR-7851	517.5	Add new section		X			Clarification
SCR-38	517.5	Delete new section		X			Clarification
FR-8662	517.10(B)	The panel sees value in further defining the spaces where Part II shall not apply.		X			Clarification
FR-8700	517.12	Revised for clarity		X			Clarification
FR-8666	517.13	Revised for clarity		X			Clarification
FR-8670	517.16	The changes to this section provide better explanation of use of isolated receptacles outside the patient care vicinity.		X			Clarification
SR-7879	517.17	This revision is editorial in nature and will help code users avoid confusion between the use of the terms ground-fault protection of equipment and ground-fault circuit-interrupters.		X			Clarification
FR-8681	517.17(A)	The application of codes and standards to health care facilities should be based on the risk considerations of Category 1 (critical care) rather than the occupancy of the building.		X			Clarification
FR-8701	517.17(B)	Revised for clarity		X			Clarification
FR-8685	517.17(D)	This revision provides clarity by requiring qualified persons perform a test process of primary current injection. This correlates with the testing requirements in 230.95(C).		X			Clarification
FR-8688	517.18(A)	Revised for clarity		X			Clarification
FR-8690	517.18(B)	Revised for clarity		X			Clarification
FR-8697	517.19(G)	Revised for clarity		X			Clarification
FR-8698	517.19(H)	Revised for clarity		X			Clarification
FR-8796	517.21	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7859	517.21	Section 517.21 was clarified to differentiate the GFCI protection requirements for patient bed locations equipped with sinks or basins and the GFCI requirements for patient bathrooms and toilet rooms beyond the patient bed location but still within the overall “patient room."		X			Clarification
SR-7908	517.24	Add new section		X			Clarification
SCR-39	517.24	Detete new section		X			Clarification
SR-7909	517.25	Revised for clarity		X			Clarification
FR-8712	517.25	Revision		X			Clarification
FR-8713	517.26	Extracted material inserted from NFPA 99 – 2018 Section 6.7.5.1.2.2 will improve the correlation between NFPA 99 and NFPA 70.		X			Clarification
SR-7916	517.26	Revised for clarity		X			Clarification
FR-8714	517.29	The revised language correlates NFPA 99 Type 1 language with the Section 517.		X			Clarification
SR-7922	517.29	Revised for clarity		X			Clarification
FR-8719	517.30(A), 517.30(B)	Revised for clarity		X			Clarification
FR-8723	517.30(C)	Revised for clarity		X			Clarification
FR-8732	517.31(A)	Revised for clarity		X			Clarification
FR-8740	517.31(B)	The references to NFPA 99 have been updated.		X			Clarification
SR-7931	517.31(B)	Revised for clarity		X			Clarification
FR-8772	517.31(C)(1)	Revised for clarity		X			Clarification
SR-7941	517.31(C)(1)	Identification of emergency circuits, in accordance with 700.10(A), is applicable in Article 517 for EES and permits various methods to be used.		X			Clarification
FR-8748	517.31(C)(3)	Revised for clarity		X			Clarification
SR-7957	517.31(C)(3)	The reference to steel flexible metal conduit in (3)(f) was deleted to permit the use of metal sheathed cable.		X			Clarification
FR-8773	517.31(D)	The revised text adds clarity to the Code and applies to all alternate power sources as outlined in 517.30.		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7964	517.31(D)	Revised for clarity		X			Clarification
SR-7968	517.31(G)	Revised for clarity		X			Clarification
SR-7969	517.32	Revised for clarity		X			Clarification
FR-8774	517.34(A)	The words “Fixed Equipment” were added to the title to provide clarity.		X			Clarification
SR-7971	517.34(A)	Revised for clarity		X			Clarification
FR-8777	517.35(C)	Revised for clarity		X			Clarification
FR-8710	517.40	Revised for clarity		X			Clarification
SR-7972	517.40	Revised for clarity		X			Clarification
FR-8811	517.42	Extracted material from NFPA 99-2018 was updated to the current language and references.		X			Clarification
SR-7940	517.42(B)	Revised for clarity		X			Clarification
FR-8810	517.42(C)	Revised for clarity		X			Clarification
FR-8780	517.44(B)	Revised for clarity		X			Clarification
FR-8782	517.45(D)	Revised for clarity		X			Clarification
FR-8785	517.61(A)(5), 517.61(A)(6)	Revised for clarity		X			Clarification
FR-8783	517.61(B)(5)	Revised for clarity		X			Clarification
FR-8705	517.61(C)(1)	Revised for clarity		X			Clarification
FR-8787	517.61(C)(2)	Revised for clarity		X			Clarification
FR-8708	517.72(A)	Revised for clarity		X			Clarification
FR-8702	517.81	Revised for clarity		X			Clarification
	Article 518	**Assembly Occupancies**					Clarification
FR-8813	518.2	Revised for clarity		X			Clarification
FR-8820	518.4(A)	Revised for clarity		X			Clarification
FR-8821	518.4(B)	Revised for clarity		X			Clarification
FR-8822	518.5	Revised for clarity		X			Clarification
FR-8823	518.6	New Section: In assembly occupancies, fixed service equipment is often installed outdoors. Unlike indoor service equipment, where illumination is required by 110.26(D), this outdoor equipment has no such illumination requirement. Due to the large number of people affected in assembly occupancies, illumination of this outdoor			X	$500	Safety

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			Decrease	None	Increase		
Sub Code:							
		equipment will provide an increase in safety and speed of safe access for maintenance personnel					
	Article 520	**Theaters, Audience Areas of Motion Picture and Television Studios, Performance Areas, and Similar Locations**					
FR-8826	520.2	Revised for clarity		X			Clarification
SR-7982	520.9	Revised for clarity		X			Clarification
FR-8827	520.25(B)	Resistance and reactor type dimmers for theatrical use have not been manufactured or installed for at least 50 years. It is now time to delete this obsolete section of the Code.		X			Clarification
FR-8828	520.27(B)	Revised for clarity		X			Clarification
FR-8830	520.44	Revised for clarity		X			Clarification
SR-7983	520.44(C)(3)	Revised for clarity		X			Clarification
FR-8831	520.46	Revised for clarity		X			Clarification
FR-8832	520.49	Revised for clarity		X			Clarification
FR-8817	520.53(B)	Revised for clarity		X			Clarification
FR-8815	520.54	Revised for clarity		X			Clarification
FR-8856	520.62(E)	Revised for clarity		X			Clarification
FR-8833	520.68	Allows "hard usage" instead of "extra hard usage" cable in protected situations		X			Added an additional cable type
FR-8837	520.81	Revised for clarity		X			Clarification
	Article 522	**Control Systems for Permanent Amusement Attractions**					
FR-8838	522.2	Revised for clarity		X			Clarification
SR-8002	522.22	Revised for clarity		X			Clarification
SCR-53	522.22	Revised for clarity		X			Clarification
FR-8840	522.22	Revised for clarity		X			Clarification
FR-8842	522.24(B)(3)	Revised for clarity		X			Clarification
	Article 525	**Carnivals, Circuses, Fairs, and Similar Events**					Clarification
FR-8843	525.2	Revised for clarity		X			Clarification
SR-7987	525.20(G)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8844	525.20(G)	If utilized, non-conductive matting must be secured to in place to the walkway surface to minimize tripping hazard. In addition, there are other approved cable protection methods such as cable "crossovers" that are also effective. This section now allows either secured matting or an approved alternate protection method.		X			Provides new options for protecting temporary cabling
FR-8845	525.21(B)	Revised for clarity		X			Clarification
SR-7993	525.23	Revised for clarity		X			Clarification
FR-8846	525.30	Revised for clarity		X			Clarification
	Article 530	**Motion Picture and Television Studios and Similar Locations**					
FR-8847	530.1	Revised for clarity		X			Clarification
FR-8848	530.2	Revised for clarity		X			Clarification
FR-8849	530.16	Revised for clarity		X			Clarification
FR-8850	530.17(A)	Revised for clarity		X			Clarification
FR-8852	530.18(E)	Revised for clarity		X			Clarification
FR-8861	530.19(B)	Revised for clarity		X			Clarification
FR-8851	530.20	Revised for clarity		X			Clarification
FR-8853	530.21(B)	Revised for clarity		X			Clarification
FR-8855	530.22(B)	Revised for clarity		X			Clarification
SR-7996	530.23	Revised for clarity		X			Clarification
	Article 540	**Motion Picture Projection Rooms**					
FR-8816	540.1	Revised for clarity		X			Clarification
FR-8857	540.2	Revised for clarity		X			Clarification
FR-8858	540.10	Revised for clarity		X			Clarification
FR-8860	540.11(A)(4)	Revised for clarity		X			Clarification
	Article 545	**Manufactured Buildings and Relocatable Structures**					
FR-8993	545	The requirements for "mobile homes used as other than dwelling units," formally covered in Article 550, have been incorporated into Article 545. The term "relocatable structures" was chosen as it is already a commonly used industry term that still identifies the portable nature of these		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
		units. This will also distinguish them from other manufactured buildings. The relocation of these requirements to Article 545 will make it clear to readers of the Code that Article 550 now only covers mobile and manufactured homes that are intended to be used as dwelling units and mobile home parks.					
SR-7518	545.1	Revised for clarity		X			Clarification
FR-8137	545.2	Revised for clarity		X			Clarification
SR-7521	545.6	Revised for clarity		X			Clarification
SR-7519	545.20	Revised for clarity		X			Clarification
SR-7529	545.22(A)	The removal of the text "permanently installed" clarifies that relocatable structures simply need to be supplied by a feeder which may not always be permanent such as in the case of some construction trailers.		X			Clarification
SR-7541	545.22(B)	Revised for clarity		X			Clarification
SR-7548	545.22(C)	Revised for clarity		X			Clarification
SR-7550	545.22(D)	The added text will permit the chassis bonding conductor which originates as the structure’s disconnecting means to serve as the tap conductor to the common grounding electrode conductor.		X			Clarification
SR-7559	545.22(E)	Deleted 545.22(E), severely limited the installation options for supply conductors without improving safety.		X			Clarification
SR-7561	545.24(A)	Revised for clarity		X			Clarification
SR-7570	545.24(B)	Revised for clarity		X			Clarification
SR-7533	545.27	New Section: The added text provides the needed relief from having to install and intersystem bonding termination at each relocatable structure disconnecting means while still providing a connection between the communications system and each relocatable structure.		X			Clarification

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			Decrease	None	Increase		
Sub Code:							
SR-7524	545.28	Revised GFI requirements to match revised 210.8(B)		X			Clarification
	Article 547	**Agricultural Buildings**					
FR-8146	547.1	Revised for clarity		X			Clarification
FR-8145	547.2	Revised for clarity		X			Clarification
FR-8149	547.4	Revised for clarity		X			Clarification
FR-8155	547.5(F)	The intent of the section is to require insulation for separate, underground equipment grounding conductors.		X			Clarification
FR-8169	547.5(G)	Places some limitations on 210.8(B) GFCI requirements in ag buildings.		X			Clarification
SR-7654	547.5(G)						Clarification
SCR-28	547.5(G)						Clarification
FR-8175	547.9	Revised for clarity		X			Clarification
FR-8181	547.10(B)	Revised for clarity		X			Clarification
	Article 550	**Mobile Homes, Manufactured Homes, Mobile Home Parks**					
FR-8236	550.1	Revised for clarity		X			Clarification
FR-8465	550.2	Revised for clarity		X			Clarification
FR-8291	550.4(C)	Revised for clarity		X			Clarification
FR-8466	550.10(B)	Revised for clarity		X			Clarification
FR-8256	550.10(C)	Revised for clarity		X			Clarification
FR-8293	550.13(B)	Places some limitations on 210.8(B) GFCI requirements in mobile homes		X			Clarification
SR-7634	550.13(B)						
SCR-29	550.13(B)						
FR-8299	550.15	Allows aluminum cable in mobile home		X			Allows aluminum cabling
FR-8467	550.15(D)	Revised for clarity		X			Clarification
FR-8469	550.15(G)	Revised for clarity		X			Clarification
SR-7628	550.30	Revised for clarity		X			Clarification
FR-8468	550.32(B)	Revised for clarity		X			Clarification
FR-8306	550.32(C)	Revised for clarity		X			Clarification
SR-7656	550.32(E)			X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SCR-31	550.32(E)	210.8(B) GFCI requirements apply to receptacles in a mobile home, but not to receptacles providing power to a mobile home					
FR-8310	550.33(A)	Revised for clarity		X			Clarification
FR-8315	550.33(B)	Revised for clarity		X			Clarification
	Article 551	**Recreational Vehicles and Recreational Vehicle Parks**					
FR-8325	551.1	Revised for clarity		X			Clarification
FR-8471	551.2	Revised for clarity		X			Clarification
FR-8377	551.4(A)	Revised for clarity		X			Clarification
FR-8404	551.40(D)	New Section: Require reverse polarity device on 120V service			X	$100	Safety
FR-8328	551.41(A)	Revised for clarity		X			Clarification
FR-8333	551.41(B)	Require at least one receptacle in areas for transporting internal combustion engines to eliminate the use of extension cords			X	$50	Safety
FR-8341	551.41(C)	Revised for clarity		X			Clarification
SR-7673	551.41(C)	Dishwashers and laundry equipment require GFCI protection			X	$50	Safety
SR-7675	551.41(C)(5)	Revised for clarity		X			Clarification
FR-8356	551.44	This will prevent modified RV's from plugging into more that one receptacle to provide power to their RV.		X			Safety
SR-7668	551.44	Revised for clarity		X			Clarification
SR-7681	551.46(C)	Revised for clarity		X			Clarification
FR-8472	551.46(C)	Revised for clarity		X			Clarification
FR-8359	551.46(D)	Revised for clarity		X			Clarification
FR-8473	551.47(M)	Revised for clarity		X			Clarification
FR-8374	551.47(P)	Revised for clarity		X			Clarification
FR-8411	551.47(R)	Revised for clarity		X			Clarification
FR-8376	551.51(A)(2)	Revised for clarity		X			Clarification
FR-8474	551.54	Revised for clarity		X			Clarification
FR-8382	551.55(E)	Revised for clarity		X			Clarification
FR-8384	551.56(B)	Revised for clarity		X			Clarification
FR-8475	551.71	Revised for clarity		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7659	551.71(F)	Places some limits on the 210.8(B) GFCI requirements for RVs		X			Reliability
SCR-30	551.71(F)						
FR-8414	551.72(D)	New Section: Cannot use autotransformers. Can use listed surge suppressors.		X			Reliability
SR-7670	551.72(F)	New Section: RVs can have only (1) 30 or 50 amp service		X			Safety
FR-8424	551.75	Revised for clarity		X			Clarification
FR-9006	551.76(A)	Revised for clarity		X			Clarification
FR-8427	551.81	Revised for clarity		X			Clarification
	Article 552	**Park Trailers**					
FR-8476	552.2	Revised for clarity		X			Clarification
FR-8434	552.10(B)(2)	Revised for clarity		X			Clarification
FR-8437	552.10(D)	Revised for clarity		X			Clarification
FR-8438	552.20(C)	Revised for clarity		X			Clarification
FR-8439	552.43(B)	Revised for clarity		X			Clarification
FR-8441	552.44(C)(1)	Revised for clarity		X			Clarification
FR-8442	552.44(C)(2)	Revised for clarity		X			Clarification
FR-8477	552.44(D)	Revised for clarity		X			Clarification
FR-8445	552.48(O)(1)	Revised for clarity		X			Clarification
FR-8478	552.55	Revised for clarity		X			Clarification
FR-8448	552.57(B)	Revised for clarity		X			Clarification
	Article 555	**Marinas, Boatyards, and Commercial and Noncommercial Docking Facilities**					
FR-8978	555	Adding "Floating Buildings" to Article 555 Title		X			Clarification
SR-7694	555.1	Revised for clarity		X			Clarification
FR-8951	555.1	Adding "Floating Buildings" to section		X			Clarification
FR-8952	555.2	Adding new definitions for terms which were not previously defined in this section adds clarity for the user.		X			Clarification
FR-8954	555.3	To clarify the requirements for ground fault protection, the language is divided into two parts. Subpart (A) addresses the shore power receptacles, as well as the feeders and branch circuits supplying the receptacles from shore. Review of “Electric		X			Safety

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			Decrease	None	Increase		
Sub Code:							
		Shock Drowning" (ESD) incidents show that 50% of the ESD instances may be avoided by the 30 mA protection at the shore power receptacles.					
FR-8955	555.4	Reduce max voltage from 1,000V to 250V. If engineering supervision is used, then the max will be 600V. The intent to reduce shock hazards			X	Varies	Safety
SR-7715	555.4	Revised for clarity		X			Clarification
FR-8809	555.5	Revised for clarity		X			Clarification
FR-8957	555.5	New transformers and replacements of old transformers must be listed for wet locations		X			Safety
SR-7695	555.5	Revised for clarity		X			
FR-8959	555.9	Connections on piers shall be listed for wet locations		X			Safety
FR-8976	555.9	New Section: GFCI protection for personnel shall be provided for outlets not exceeding 240 volts that supply a boat hoist installed at dwelling unit docking facilities.			X	$100	Safety
FR-8977	555.10	Revised for clarity		X			Clarification
FR-8965	555.13(B)(2)	Revised for clarity		X			Clarification
FR-8966	555.13(B)(3)	Revised for clarity		X			Clarification
FR-8967	555.13(B)(4)	Revised for clarity		X			Clarification
FR-8968	555.15	Revised for clarity		X			Clarification
FR-8969	555.17(B)	Revised for clarity		X			Clarification
FR-8970	555.19(A)	Revised for clarity		X			Clarification
FR-8974	555.19(C)	New Section: The section will now explicitly states that requirements shall apply to replacement of marina receptacles.		X			Clarification
FR-8975	555.19(B)	he reference to 210.8 clarifies the GFCI protection requirements will include both dwelling and non-dwelling installations for "other than shore power" receptacles around marinas.		X			Safety
SR-8248	555.33(A)(1)	Revised for clarity		X			Clarification
SR-7712	555.35	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8973	555.38	New Section: Require equipotential bonding		X			Clarification
SR-7711	555.38	Delete new section		X			Clarification
SR-7713	555.57	Revised for clarity		X			Clarification
	Article 590	**Temporary Installations**					
FR-8769	590.4(F)	Revised for clarity		X			Clarification
SR-7894	590.4(G)	Revised for clarity		X			Clarification
FR-8770	590.4(G)	Revised for clarity		X			Clarification
FR-8771	590.6(B)	Revised for clarity		X			Clarification
SR-7904	590.6(B)(2)	Revised for clarity		X			Clarification
SR-7919	590.8	New Section: Section 590.8 was added to provide guidance for AHJ's in the reuse of equipment.		X			Guidance to AHJ
	CHAPTER 6	**SPECIAL EQUIPMENT**					
	Article 600	**Electric Signs and Outline Lighting**					
FR-8141	600.2	Revised for clarity		X			Clarification
FR-8153	600.3	New Definition: Host Sign		X			Clarification
FR-8148	600.3	New Definition: Retrofit Kit, General Use		X			Clarification
FR-8156	600.3	New Definition: Retrofit Kit, Sign Specific		X			Clarification
FR-8154	600.3	New Definition: Subassembly		X			Clarification
FR-8157	600.3	Revised for clarity		X			Clarification
FR-8159	600.4	Revised for clarity		X			Clarification
SR-8230	600.4	Revised for clarity		X			Clarification
FR-8171	600.5(A)	This section is clarified to state that entrances not accessible to customer, such as delivery doors, do not require a sign outlet.		X			Clarification
SR-8232	600.5(A)	Revised for clarity		X			Clarification
FR-8174	600.5(B)	New Section: A disconnecting means for a sign, outline lighting system, or controller shall be marked with the identity of the sign			X	$25	Safety
SR-8234	600.5(B)	Revised for clarity		X			Clarification
FR-8180	600.5(C)(1)	Revised for clarity		X			Clarification
FR-8186	600.5(C)(2)	Revised for clarity		X			Clarification
FR-8200	600.6	Revised for clarity		X			Clarification
SR-8237	600.6(A)(1)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8289	600.6(A)(4)	New Section: This revision will allow access to and identify the location of the disconnect for first responders and service personnel.		X			Safety
SR-8238	600.7(A)(2)	Revised for clarity		X			Clarification
SR-8239	600.10(C)(2)	Revised for clarity		X			Clarification
FR-8216	600.30	Revised for clarity		X			Clarification
SR-8241	600.33	Revised for clarity		X			Clarification
FR-8217	600.33(A)	Riser cables are not allowed in a plenum. To correct this inaccuracy, this revision adds separate lines for Risers and Plenums.		X			Safety
FR-8223	600.33(C)	Revised for clarity		X			Clarification
FR-8227	600.34	New Section: Retrofit kits needed to be added to the article with the installation requirements.		X			Safety
	Article 604	**Manufactured Wiring Systems**					
FR-8204	604.1	Revised for clarity		X			Clarification
SR-7606	604.2	Revised for clarity		X			Clarification
FR-8449	604.100(A)(1)	Revised for clarity		X			Clarification
FR-8450	604.100(A)(2)	Revised for clarity		X			Clarification
	Article 605	**Office Furnishings**					
FR-8139	605.1	Revised for clarity		X			Clarification
FR-8140	605.2	Revised for clarity		X			Clarification
	Article 610	**Cranes and Hoists**					
SR-7765	610.2	Revised for clarity		X			Clarification
FR-8142	610.11	Revised for clarity		X			Clarification
SR-7763	610.14(A)	Revised for clarity		X			Clarification
SCR-20	610.14(A)	Revised for clarity		X			Clarification
FR-8147	610.61	Revised for clarity		X			Clarification
SR-7766	610 Part VII	The title of part VII was revised to include the words “and Bonding”		X			Clarification
	Article 620	**Elevators, Dumbwaiters, Escalators, Moving Walks, Platform Lifts, and Stairway Chairlifts**					
FR-8205	620	Revised for clarity		X			Clarification
SR-7767	620.2	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7769	620.6	This language clarifies the mandatory requirements for GFCI protection for personnel within the scope of article 620.		X			Clarification
FR-8238	620.16(B)	Revised for clarity		X			Clarification
FR-8240	620.21	Revised for clarity		X			Clarification
SR-7770	620.21	Revised for clarity		X			Clarification
FR-8248	620.21(A)(1)	Revised for clarity		X			Clarification
SR-7771	620.22(A)	Revised for clarity		X			Clarification
FR-8255	620.22(A)	This change clarifies which types of equipment are permitted to be supplied by the required branch lighting circuit, and specifies the location of the overcurrent device in those situations where there is no machine room/machine space. This will aid in clarifying Code requirements for installers and aid in enforcement.		X			Safety
FR-8260	620.25(B)	Revised for clarity		X			Clarification
FR-8244	620.41	Revised for clarity		X			Clarification
FR-8261	620.51	Revised for clarity		X			Clarification
FR-8262	620.51(A)	Revised for clarity		X			Clarification
FR-8263	620.51(D)(2)	Revised for clarity		X			Clarification
FR-8267	620.51(E)	Surge protection requirements were expanded to cover all loads that impact life safety to ensure the reliability necessary for these critical loads.		X			Safety
FR-8292	620.53	Where there is no machine room or control room, there is often no machine space or control space outside of the hoistway. This change will clarify Code requirements for location of disconnecting means and aid in installation and enforcement		X			Safety
FR-8294	620.54	Revised for clarity		X			Clarification
FR-8317	620.62	New Section: This change requiring field marking of enclosures for selectively coordinated overcurrent devices will provide a higher level of safety to those authorized to maintain or inspect such systems. This change will also aid in			X	$50	Safety

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
		enforcement by making information readily available to inspectors.					
FR-8309	620.62	This change will aid in design, installation, maintenance, and enforcement by clarifying those situations where selective coordination is required		X			Safety
FR-8322	620.85	The Panel revised this text to be clear that any receptacle in a pit must be GFCI protected.		X			Clarification
FR-8619	620.91	This revision is made to inform the user about the additional requirements in some local building codes for fire service access and occupant evacuation elevators.		X			Clarification
FR-8207	620 Part IX	This change will clarify that requirements for Grounding AND Bonding must both be satisfied		X			Clarification
	Article 625	**Electric Vehicle Power Transfer System**					
FR-8383	625	With the addition of power export equipment and bidirectional current flow equipment, a change to the title of the Article is needed to clarify that they are included.		X			Clarification
FR-8391	625	Revised for clarity		X			Clarification
FR-8410	625	Some of the construction requirements in Part II of Article 625 of NFPA 70-2017 address product features that are an integral part of the product listing requirements. With the elimination of these sections, two definitions that are not used elsewhere in the chapter are also removed.		X			Clarification
SR-7776	625.1	Revised for clarity		X			Clarification
FR-8385	625.1	With the addition of power export equipment and bidirectional current flow equipment, a change to the scope of the Article is needed to clarify that they are included.		X			Clarification
FR-8597	625.2	New Definition: Electric Vehicle Power Export Equipment (EVPE)		X			Clarification
SR-7779	625.2	Revised for clarity		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7792	625.5	Revised for clarity		X			Clarification
FR-8399	625.5	Revised for clarity		X			Clarification
FR-8496	625.17(A)	Defines the maximum length for portable (1') and stationary cords (6').		X			Safety
FR-8487	625.17(B)	The language in this TIA recognizes the fast evolving EV charging technology while addressing the safety concerns by allowing the use of engineered cabling solutions that are an integral (nondetachable) part of the listed electric vehicle supply equipment (EVSE).		X			Convenience
FR-8509	625.17(C)	New Section: This addition permits these engineered solutions to be implemented in the field based on product listing as required by 625.5.		X			Convenience
FR-8506	625.17(C)	Revised for clarity		X			Clarification
FR-8516	625.22	Revised for clarity		X			Clarification
FR-8554	625.41	With the expansion of the scope over the last two code cycles, additional equipment types were added to Article 625. This revision is needed to remove the all-encompassing word “equipment” and replace this with the specific equipment types that are covered by the requirement.		X			Clarification
SR-7802	625.42	Revised for clarity		X			Clarification
SCR-21	625.42	Revised for clarity		X			Clarification
FR-8556	625.42	Vehicle power transfer equipment is allowed to have adjustable settings if the access to the settings is restricted.		X			Clarification
SR-7803	625.43	Revised for clarity		X			Clarification
FR-8569	625.43	Revised for clarity		X			Clarification
FR-8573	625.44	Revised for clarity		X			Clarification
SR-7806	625.48	Revised for clarity		X			Clarification
FR-8576	625.48	Revised for clarity		X			Clarification
FR-8577	625.50	Revised for clarity		X			Clarification
FR-8586	625.52(A)	Revised for clarity		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8588	625.52(B)	Revised for clarity		X			Clarification
FR-8591	625.52(B)(4)	Revised for clarity		X			Clarification
SR-7809	625.54	all receptacles installed for the connection of electric vehicle charging shall have ground-fault circuit-interrupter protection for personnel.		X			Safety
FR-8581	625.54	The requirements were changed to clarify the intent of providing GFCI protection for personnel for all cord and plug connected electric vehicle power transfer equipment.		X			Safety
FR-8534	625.56	New Section: adds a new section to cover receptacles located in a vehicle.		X			Safety
FR-8584	625.56	Revised for clarity		X			Clarification
SR-7796	625.60(A)	Revised for clarity		X			Clarification
SR-7798	625.60(C)	Revised for clarity		X			Clarification
SR-7799	625.60(D)	Revised for clarity		X			Clarification
SR-7800	625.60(E)	The requirement for listing of on board inverters was removed since GFCI protection is required and provides methods of personal protection.		X			Clarification
SR-7801	625.60(F)	Revised for clarity		X			Clarification
FR-8589	625.102	Revised for clarity		X			Clarification
	Article 626	**Electrified Truck Parking Spaces**					
FR-8601	626.1	Revised for clarity		X			Clarification
SR-7811	626.2	Revised for clarity		X			Clarification
FR-8604	626.4	Revised for clarity		X			Clarification
FR-8605	626.11(B)	Revised for clarity		X			Clarification
FR-8607	626.24(B)	These demand factors do not apply to the portion of electrical wiring systems that supply the transport refrigerated units (TRUs).		X			Clarification
SR-7812	626.24(D)	Revised for clarity		X			Clarification
FR-8609	626.25(B)(4)	Revised for clarity		X			Clarification
SR-7814	626.25(B)(4)	Revised for clarity		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8610	626.30(A)	TRUs exist today that are powered by 240-volt, 3 phase supplies and these TRUs should be allowed at truck parking spacings that provide power to TRUs.		X			Add 240V 3-phase option for TRUs
FR-8611	626.31(C)	Transport refrigeration units exist today that are powered from the 60 ampere receptacles included in the revision. Without the allowance of these receptacle types, trucks with refrigeration units that require this connection would not be allowed to park at the electrified truck parking space.		X			Add 60 Amp connection as option for TRUs
FR-8612	626.32(A)	Revised for clarity		X			Clarification
FR-8613	626.32(C)	Revised for clarity		X			Clarification
	Article 630	**Electric Welders**					
FR-8150	630.31(A)	Revised for clarity		X			Clarification
	Article 640	**Audio Signal Processing, Amplification, and Reproduction Equipment**					
SR-7819	640.2	Revised for clarity		X			Clarification
FR-8339	640.3(B)	Revised for clarity		X			Clarification
FR-8340	640.9(C)	Revised for clarity		X			Clarification
SR-7821	640.10(A)	Revised for clarity		X			Clarification
	Article 645	**Information Technology Equipment**		X			
SR-7822	645.2	Revised for clarity		X			Clarification
SR-7823	645.3	Revised for clarity		X			Clarification
FR-8347	645.5(E)	Revised for clarity		X			Clarification
FR-8348	645.5(E)(2), 645.5(E)(3)	This revision removes a conflict between the installation rules in section 645.5(E)(2) & (3) in the 2017 NEC (NFPA 70) and sections 11.3.7 through 11.3.7.3 in the 2017 edition of NFPA 75, Standard for the Fire Protection of Information Technology Equipment.		X			Clarification
FR-8352	645.10	Revised for clarity		X			Clarification
SR-7824	645.10(B)	The panel action on PC 120 is intended to correlate with CMP 16 second revision actions to create a new general article, Article 800, in Chapter 8 and move common		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
		requirements from multiple locations in the chapter to Article 800.					
SR-7836	645.11	Revised for clarity		X			Clarification
FR-8351	645.11	Revised for clarity		X			Clarification
FR-8355	645.14	Revised for clarity		X			Clarification
FR-8358	645.18	Revised for clarity		X			Clarification
FR-8371	645.27	Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems.		X			Qualifications updated
	Article 646	**Modular Data Centers**					
SR-7837	646.2	Revised for clarity		X			Clarification
SR-7826	646.3	Revised for clarity		X			Clarification
FR-8373	646.4	Revised for clarity		X			Clarification
SR-7827	646.19	The revised text responds affirmatively to a Correlating Committee comment intended to have consistent terminology throughout the code for panic hardware.		X			Clarification
	Article 647	**Sensitive Electronic Equipment**					
FR-8375	647.6(B)	Revised for clarity		X			Clarification
	Article 650	**Pipe Organs**					
SR-7829	650	Revised for clarity		X			Clarification
SR-7828	650.2	Revised for clarity		X			Clarification
FR-8160	650.6(D)	Revised for clarity		X			Clarification
	Article 660	**X-Ray Equipment**					
SR-7830	660.2	Revised for clarity		X			Clarification
FR-8161	660.5	Revised for clarity		X			Clarification
FR-8162	660.6(B)	Revised for clarity		X			Clarification
	Article 665	**Induction and Dielectric Heating Equipment**					
SR-7831	665.2	Revised for clarity		X			Clarification
FR-8163	665.23	Revised for clarity		X			Clarification
	Article 668	**Electrolytic Cells**					
SR-7832	668.2	Revised for clarity		X			Clarification
FR-8177	668.3(B)	Revised for clarity		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8173	668.3(C)(1), 668.3(C)(2), 668.3(C)(3)	Revised for clarity		X			Clarification
FR-8182	668.3(C)(4)	Revised for clarity		X			Clarification
FR-8166	668.11	Revised for clarity		X			Clarification
FR-8170	668.15	Revised for clarity		X			Clarification
FR-8167	668.21(B)	Revised for clarity		X			Clarification
	Article 669	**Electroplating**					
FR-8178	669.1	Revised for clarity		X			Clarification
	Article 670	**Industrial Machinery**					
SR-7833	670.2	Revised for clarity		X			Clarification
FR-8184	670.3(A)	Revised for clarity		X			Clarification
FR-8185	670.5	Revised for clarity		X			Clarification
SR-7834	670.6	Revised for clarity		X			Clarification
FR-8189	670.6	The surge protection requirement was revised to clarify that only devices not effectively isolated from incoming voltage surges shall be required to have surge protection.		X			Clarification
	Article 675	**Electrically Driven or Controlled Irrigation Machines**					
FR-8218	675.1	Revised for clarity		X			Clarification
FR-8222	675.2	Revised for clarity		X			Clarification
FR-8225	675.4(A)	Revised for clarity		X			Clarification
SR-7516	675.5	Revised for clarity		X			Clarification
FR-8219	675.7	Revised for clarity		X			Clarification
FR-8229	675.8(B)	Revised for clarity		X			Clarification
FR-8230	675.13	Revised for clarity		X			Clarification
FR-8231	675.14	Revised for clarity		X			Clarification
FR-8220	675.21	Revised for clarity		X			Clarification
	Article 680	**Swimming Pools, Fountains, and Similar Installations**					
FR-8891	680.2	New Definition: Corrosive Environment		X			Clarification
FR-8733	680.2	New Definition: Immersion Pool		X			Clarification
FR-8735	680.2	New Definition: Splash Pad		X			Clarification
FR-8717	680.2	Revised for clarity		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8904	680.3	Revised for clarity		X			Clarification
FR-8737	680.4	New Section: his section was added to provide the authority having jurisdiction with the opportunity to address hazards associated with aging pool installations.		X			Safety
FR-8739	680.4	Revised for clarity		X			Clarification
SR-8057	680.4	Revised for clarity		X			Clarification
SR-8103	680.5	Revised for clarity		X			Clarification
SCR-59	680.5	Revised for clarity		X			Clarification
FR-8746	680.6	Revised for clarity		X			Clarification
SR-8067	680.6	Title of 680.6 was revised to read “Bonding and Equipment Grounding” to more clearly account for the requirements in this section.		X			Clarification
SCR-60	680.6	Revised for clarity		X			Clarification
FR-8749	680.7	Text modified to clarify it is intended to address bonding and equipment grounding connectors.		X			Clarification
FR-8752	680.9(A)	Revised for clarity		X			Clarification
FR-8753	680.9(B)	Revised for clarity		X			Clarification
FR-8801	680.11	Adding the 5’ horizontal distance to the NEC provides assurance of adequately used wiring methods that are listed for direct burial in these areas where exposure is a concern.		X			Clarification
SR-8071	680.11	Revised for clarity		X			Clarification
SR-8142	680.14	680.14 was revised to correlate with the new definition for corrosive environment that was added to 680.2.		X			Clarification
SCR-61	680.14	Revised for clarity		X			Clarification
FR-8784	680.21(A)	Revised for clarity		X			Clarification
SR-8090	680.21(A)	Revised for clarity		X			Clarification
FR-8781	680.21(B)	Revised for clarity		X			Clarification
FR-8775	680.21(C)	New Section: Where a pool pump motor in 680.21(C) is replaced for maintenance or repair, the replacement pump motor shall be provided with ground-fault circuit-interrupter protection.		X	X	Varies	Safety

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8778	680.21(C)	Clarifies that GFCI protection for pool pumps also applies to 3 phase motors		X			Clarification
SR-8095	680.21(C)	Revised for clarity		X			Clarification
SR-8128	680.22(A)	At least one GCFI-protected 125-volt, 15- or 20- ampere receptacle on a general-purpose circuit shall be located within a pool equipment room, and all other receptacles supplied by branch circuits rated 150 volts or less to ground within a pool equipment room shall be GFCI protected.		X			Safety
SCR-62	680.22(A)	Revised for clarity		X			Clarification
FR-8789	680.22(A)(4)	Revised for clarity		X			Clarification
FR-8786	680.22(B)(8)	New Section: Clarifies how to measure distance to luminaires		X			Clarification
SR-8106	680.22(C)	680.22(C) was revised to better explain the 5 ft reach distance with regard to a permanent barrier when the switch is located behind a wall, within a room, etc.		X			Clarification
FR-8791	680.22(D)	New Section: Other equipment with ratings exceeding the low-voltage contact limit shall be located at least 1.5 m (5 ft) horizontally from the inside walls of a pool unless separated from the pool by a solid fence, wall, or other permanent barrier.		X			Clarification
FR-8792	680.23(B)(2)	Red brass and stainless steel are the only materials of metal conduit that have proven suitably resistant to continuous exposure to swimming pool water.		X			Clarification
FR-8794	680.23(B)(3)	Revised for clarity		X			Clarification
FR-8797	680.23(B)(4)	Revised for clarity		X			Clarification
FR-8798	680.23(B)(6)	Revised for clarity		X			Clarification
SR-8108	680.23(B)(6)	Revised for clarity		X			Clarification
FR-8803	680.23(F)(1)	Revised for clarity		X			Clarification
SR-8088	680.23(F)(1)	Revised for clarity		X			Clarification
SCR-63	680.23(F)(1)	Revised for clarity		X			Clarification
FR-8834	680.23(F)(2)	Revised for clarity		X			Clarification
SR-8113	680.23(F)(2)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8836	680.24(F)	Revised for clarity		X			Clarification
FR-8824	680.25(A)	Revised for clarity		X			Clarification
SR-8084	680.25(A)	Revised for clarity		X			Clarification
SCR-64	680.25(A)	Revised for clarity		X			Clarification
FR-8825	680.26(B)(1)	Revised for clarity		X			Clarification
SR-8126	680.26(B)(2)	Revised for clarity		X			Clarification
FR-8839	680.26(B)(5)	Bonding of anchors used for pool safety covers were added to provide clarification for inspection authorities as they have been unsure of how they should be addressed previously.		X			Assist AJH with enforcement
FR-8841	680.26(B)(6)	Revised for clarity		X			Clarification
FR-8892	680.26(C)	Revised for clarity		X			Clarification
FR-8893	680.27(A)	Revised for clarity		X			Clarification
FR-8894	680.27(B)(1)	Revised for clarity		X			Clarification
FR-8895	680.27(B)(2)	Revised for clarity		X			Clarification
FR-8903	680.30	Revised for clarity		X			Clarification
FR-8896	680.31	Revised for clarity		X			Clarification
FR-8897	680.35	New Section: This section was added to provide requirements for the newly added definition for immersion pools.		X			Clarification
SR-8131	680.35	Revised for clarity		X			Clarification
FR-8905	680.43(D)	This revision clarifies specific parts that require bonding. 680.43(D)(5) is edited to more clearly detail what is to be bonded.		X			Safety
FR-8906	680.43(F)	Exception was added to 680.43(F) to accommodate for low voltage equipment that does not require grounding.		X			Clarification
SR-8134	680.43(F)	Revised for clarity		X			Clarification
FR-8907	680.45	New Section: New section 680.45 added to address the unique aspects of Permanently Installed Immersion Pools.		X			Clarification
SR-8136	680.45	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-8135	680.45	In order to address the potential for an outlet to be connected to a branch circuit that exceeds the rating of a GFCI (e.g. a 240-volt corner grounded delta circuit exceeds 150 V to ground), a second revision was made to include the 150 volt to ground rating condition. It was also clarified that the GFCI shall be a Class A type.		X			Safety
FR-8744	680.50	Splash pads and similar installations present the same potential risk of electric shock as do the ares around swimming pools. Similar bonding should therefore be required.		X			Safety
SR-8137	680.52(B)	Revised for clarity		X			Clarification
FR-8908	680.52(B)(1)	Revised for clarity		X			Clarification
FR-8909	680.52(B)(2)	Revised for clarity		X			Clarification
FR-8910	680.53	Clarified code text by moving 680.53 to new 680.54 (4) to clarify that this is grounding vs bonding.		X			Clarification
SR-8138	680.54	Revised for clarity		X			Clarification
FR-8911	680.59	New Section: Added new section 680.59 to specifically address GFCI protection for non-submersible fountain pumps.		X			Clarification
FR-8912	680.74(A)	Revised for clarity		X			Clarification
FR-8913	680.74(B)	Revised for clarity		X			Clarification
FR-8751	680.80	Revised for clarity		X			Clarification
SR-8139	680.80	Revised for clarity		X			Clarification
SR-8140	680.82, 680.83, 680.84	Revised for clarity		X			Clarification
	Article 682	**Natural and Artificially Made Bodies of Water**					
FR-8921	682.1	Revised for clarity		X			Clarification
FR-8919	682.2	New Definition: Pier		X			Clarification
FR-8914	682.2	Revised for clarity		X			Clarification
SR-8143	682.4	New Section: This revision provides clarity that this article is not meant to include specific industrial process applications.		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8917	682.15	Revised for clarity		X			Clarification
SR-8023	682.15	Revised for clarity		X			Clarification
SCR-65	682.15	Revised for clarity		X			Clarification
SR-8029	682.33(B)	Revised for clarity		X			Clarification
FR-8920	682.33(C)	Revised for clarity		X			Clarification
	Article 685	**Integrated Electrical Systems**					
FR-8201	685.1	Revised for clarity		X			Clarification
	Article 690	**Solar Photovoltaic (PV) Systems**					
FR-8568	690.1	The entire phrase about batteries has been removed as it is only one example of what a PV system may be connected to. It also clarifies the early part of the sentence to remove may and make this a more positive sentence. These particular figures have been changed to informational notes since they are intended for informational purposes only and are not meant to dictate design standards or configurations. The terms in the figures where revised for consistency throughout articles under the purview of CMP-4.		X			Clarification
SR-8243	690.1	Revised for clarity		X			Clarification
FR-8520	690.2	New Definition: AC Module System		X			Clarification
FR-8526	690.2	New Definition: Electronic Power Converter		X			Clarification
FR-8741	690.2	Revised for clarity		X			Clarification
FR-8152	690.6	Pre-engineered ac module systems will have components specified in their instructions that will interconnect multiple ac modules into a system with a single output circuit. This output circuit from such a system should be treated like an inverter output circuit just like a single ac module's output is. All dc and ac wiring up to the system termination point, as identified in its instructions, should be considered internal to the system.		X			Clarification
SR-7930	690.6(A)	Revised for clarity		X			Clarification
SR-7921	690.6(C)	Deleted		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8158	690.7	There is a potential for confusion when applying voltage and voltage to ground requirements throughout this Code as it relates to dc PV system circuits. To clarify how voltage is to be used, the statement in the sentence at the end of 690.7(A) is moved to the initial charging paragraph as examples of how maximum voltage is to be applied.		X			Clarification
SR-8132	690.7	Revised for clarity		X			Clarification
FR-8165	690.7(A)	Revised for clarity		X			Clarification
SR-7944	690.7(A)	Revised for clarity		X			Clarification
FR-8179	690.7(B)(1)	Revised for clarity		X			Clarification
FR-8183	690.7(B)(2)	Revised for clarity		X			Clarification
FR-8168	690.7(C)	Revised for clarity		X			Clarification
FR-8172	690.8(A)	Revised for clarity		X			Clarification
SR-8133	690.8(A)	Revised for clarity		X			Clarification
FR-8194	690.8(A)(1)	New Section: his new paragraph allows for a 1000-amp input on an inverter to be supplied by five 200-amp PV output circuits each with 250-amp overcurrent devices. Each conductor would be sized for a minimum ampacity of 250-amps before the application of adjustment and correction factors [690.8(B)].		X			Clarification
FR-8756	690.8(A)(1)	Revised for clarity		X			Clarification
FR-8202	690.8(A)(2)	Revised for clarity		X			Clarification
FR-8208	690.8(A)(4)	Revised for clarity		X			Clarification
FR-8210	690.8(A)(6)	Revised for clarity		X			Clarification
FR-8213	690.8(B)	Revised for clarity		X			Clarification
SR-7949	690.8(B)	Revised for clarity		X			Clarification
FR-8226	690.9(A)	Revised for clarity		X			Clarification
SR-7951	690.9(A)	Revised for clarity		X			Clarification
SR-7952	690.9(A)(1)	Revised for clarity		X			Clarification
SR-7959	690.9(A)(2)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7966	690.9(A)(3)	Item (1) adds the words "and not in buildings" to further limit when a conductor of no greater than 10' can be protected from overcurrent on one end. Item (2) permits conductors of 10' or less in buildings in raceway or metal clad cable in buildings which is similar to the requirement in 240.21.		X			Clarification
SCR-01	690.9(A)(3)	Revised for clarity		X			Clarification
FR-8232	690.9(B)	permits short conductor lengths to be protected from overcurrent on one end. Short conductors are common when installing combiner boxes next to inverters and this language will prevent the wasteful practice of putting fuses on either end of a 3' wire.		X			Clarification
SR-7981	690.9(B)	Revised for clarity		X			Clarification
FR-8233	690.9(C)	Revised for clarity		X			Clarification
SR-7989	690.11	Revised for clarity		X			Clarification
FR-8239	690.11	Revised for clarity		X			Clarification
SR-7994	690.12	Revised for clarity		X			Clarification
FR-8242	690.12(A)	Revised for clarity		X			Clarification
SR-7998	690.12(A)	Revised for clarity		X			Clarification
FR-8253	690.12(B)(2)	Revised for clarity		X			Clarification
SR-8025	690.12(B)(2)	Revised for clarity		X			Clarification
FR-8249	690.12(C)	This clarifies that enclosed outbuildings for one- and two-family dwellings with attached PV arrays include the requirements for 690.12 including the location of the initiation device on the building with a PV system.		X			Clarification
SR-8005	690.12(C)	Revised for clarity		X			Clarification
FR-8251	690.12(D)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8264	690.13(A)	This revision uses a similar format to 110.31(D) which addresses equipment accessible to unqualified persons. There is a need to require, as a minimum, a tool to physically open these enclosures. The voltage level of 30V is consistent with other Article 690 requirements.		X			Clarification
FR-8266	690.13(C)	Revised for clarity		X			Clarification
FR-8290	690.13(E)	Revised for clarity		X			Clarification
SR-8033	690.13(E)	Revised for clarity		X			Clarification
FR-8295	690.13(F)	Revised for clarity		X			Clarification
FR-8305	690.15	Revised for clarity		X			Clarification
FR-8644	690.15	Revised for clarity		X			Clarification
SR-8037	690.15	Revised for clarity		X			Clarification
FR-8307	690.15(A)	Where disconnecting means of equipment operating above 30 volts are readily accessible to unqualified persons, any enclosure door or hinged cover that exposes live parts when open shall be locked or require a tool to open.		X			Safety
FR-8311	690.15(B)	Revised for clarity		X			Clarification
SR-8039	690.15(B)	Revised for clarity		X			Clarification
FR-8321	690.15(C)	New Section		X			Clarification
SR-8042	690.15(C)	This clarifies the requirements related to disconnection of equipment.		X			Clarification
FR-8316	690.15(C)	Revised for clarity		X			Clarification
FR-8327	690.15(D)	Revised for clarity		X			Clarification
SR-8045	690.15(D)	Revised for clarity		X			Clarification
FR-8704	690.31	Revised for clarity		X			Clarification
FR-8645	690.31(A)	An ampacity table for 105C and 125C has been added as Table 690.31(A)(2).		X			Clarification
SR-8050	690.31(A)	Revised for clarity		X			Clarification
FR-8647	690.31(B)	Section 690.31(B) has been clarified to address the most common application of this requirement for enforcers; installation of inverter dc input conductors and ac output conductors in the same wireway		X			Safety

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
		below an inverter. Dc and ac conductors of a PV system should not be allowed to come into contact with one another					
SR-8053	690.31(B)	The past several code cycles have prohibited PV system dc circuits from occupying the same wiring method as inverter output circuits without the use of partitions for separation. An option was added for barriers, in addition to partitions.		X			Clarification
SR-8055	690.31(B)(1)	Revised for clarity		X			Clarification
FR-8648	690.31(B)(1), 690.31(B)(2)	Revised for clarity		X			Clarification
FR-8650	690.31(C)	Revised for clarity		X			Clarification
SR-8149	690.31(C)	Revised for clarity		X			Clarification
SR-8056	690.31(C)(1)	Revised for clarity		X			Clarification
SR-8060	690.31(C)(2)	Revised for clarity		X			Clarification
SR-8062	690.31(C)(3)	Revised for clarity		X			Clarification
FR-8940	690.31(D)	Revised for clarity		X			Clarification
SR-8073	690.31(D)	Revised for clarity		X			Clarification
SR-8078	690.31(E)	Revised for clarity		X			Clarification
SR-8080	690.31(F)	Revised for clarity		X			Clarification
FR-8692	690.31(G)	Revised for clarity		X			Clarification
FR-8693	690.31(H)	Revised for clarity		X			Clarification
FR-8695	690.31(I)	New Section		X			Clarification
FR-8694	690.31(I)	Revised for clarity		X			Clarification
FR-8393	690.32	Revised for clarity		X			Clarification
SR-8085	690.33	Revised for clarity		X			Clarification
FR-8395	690.33(D), 690.33(E)	Revised for clarity		X			Clarification
FR-8144	690.4(B)	Revised for clarity		X			Clarification
SR-8144	690.4(B)	Revised for clarity		X			Clarification
FR-8754	690.4(E)	New Section: Electronic power converters and their associated devices shall be permitted to be mounted on roofs or other exterior areas that are not readily accessible.		X			Clarification
FR-8481	690.41(A)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-8087	690.41(A)	Revised for clarity		X			Clarification
FR-8398	690.41(B)	PV system circuits operating at these low voltage and power levels do not pose an arcing or other fire risk, therefore they are permitted to be installed without ground-fault protection.		X			Clarification
SR-8092	690.41(B)	Revised for clarity		X			Clarification
FR-8401	690.41(B)(1)	Revised for clarity		X			Clarification
FR-8402	690.41(B)(2)	UL 1741 requires inverters to identify, interrupt, and provide an indication of ground faults, yet the NEC has not required the installation to ensure indication is visible where no other method is provided, in the event of a fault.		X			Clarification
SR-8099	690.41(B)(3)	Revised for clarity		X			Clarification
FR-8408	690.43	Revised for clarity		X			Clarification
SR-8101	690.43	Revised for clarity		X			Clarification
FR-8413	690.45	Revised for clarity		X			Clarification
SR-8107	690.45	Revised for clarity		X			Clarification
FR-8415	690.46	Revised for clarity		X			Clarification
FR-8417	690.47(A)	Revised for clarity		X			Clarification
FR-8419	690.47(B)	Revised for clarity		X			Clarification
FR-8422	690.50	Revised for clarity		X			Clarification
FR-8707	690.51	Revised for clarity		X			Clarification
FR-8709	690.52	Revised for clarity		X			Clarification
FR-8711	690.53	Revised for clarity		X			Clarification
FR-8423	690.56(A)	Revised for clarity		X			Clarification
FR-8425	690.56(B)	Revised for clarity		X			Clarification
SR-8102	690.56(C)	Revised for clarity		X			Clarification
FR-8715	690.56(C)	Revised for clarity		X			Clarification
FR-8429	690.59	Revised for clarity		X			Clarification
FR-8703	690 Part IV	Revised for clarity		X			Clarification
	Article 691	**Large-Scale Photovoltaic (PV) Electric Supply Stations**					Clarification
FR-8949	691	Replace "Power Production Facility" to "Electric Supply Stations"		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8585	691.1	Revised for clarity		X			Clarification
FR-9002	691.2	Revised for clarity		X			Clarification
FR-8948	691.4	Revised for clarity		X			Clarification
FR-8435	691.5	Revised for clarity		X			Clarification
SR-8221	691.5	Revised for clarity		X			Clarification
FR-8440	691.9	Per 691.4, the entire site is only accessible to authorized personnel, operated and maintained by qualified persons, and controlled access. Such a site should be expected to have written procedures for the operation and maintenance of the system, and this documentation should include means for isolating equipment. Where such documentation is provided, it is not necessary to require that isolating devices be located within site of the equipment being isolated, or within a certain distance of equipment being isolated.		X			Clarification
SR-8112	691.9	Revised for clarity		X			Clarification
FR-8444	691.11	Fence bonding and grouding generally applies to the portion enclosing the substaiton portions of an electrical supply station.		X			Clarification
SR-8115	691.11	Revised for clarity		X			Clarification
	Article 692	**Fuel Cell Systems**		X			Clarification
FR-8992	692.2	Revised for clarity		X			Clarification
FR-8485	692.4(B)	Revised for clarity		X			Clarification
SR-8117	692.4(B)(2)	Revised for clarity		X			Clarification
SR-8224	692.6	Revised for clarity		X			Clarification
FR-8489	692.10	Deleted: The requirements for stand-alone systems in Articles 690 and 694 were moved to Article 710 in the 2017 NEC.		X			Clarification
SR-8235	692.64	Revised for clarity		X			Clarification
	Article 694	**Wind Electric Systems**					Clarification
SR-8118	694.2	Revised for clarity		X			Clarification

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CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-8119	694.7(B)	Stating that equipment has a field evaluation does not guarantee that a field label is installed. NFPA 791 includes a recommendation for a label to be installed but does not mandate it as quoted below. The process of applying a field label for field evaluated equipment is extremely important for AHJs.		X			Safety
FR-8501	694.7(B)	Revised for clarity		X			Clarification
SR-8121	694.7(E)	Revised for clarity		X			Clarification
SR-8226	694.7(F)	Stating that equipment has a field evaluation does not guarantee that a field label is installed. NFPA 791 includes a recommendation for a label to be installed but does not mandate it as quoted below. The process of applying a field label for field evaluated equipment is extremely important for AHJs.		X			Clarification
FR-8503	694.10(A)	Revised for clarity		X			Clarification
FR-8493	694.22(C)(1)	For one-family and two-family dwellings, a disconnecting means or manual shutdown button or switch shall be located at a readily accessible location outside the building.			X	$ 250	Safety
FR-8514	694.22(C)(2)	Revised for clarity		X			Clarification
FR-8513	694.54	Revised for clarity		X			Clarification
SR-8122	694.54(B)	Revised for clarity		X			Clarification
	Article 695	**Fire Pumps**					
FR-8980	695	Revised for clarity		X			Clarification
FR-7721	695.2	Revised for clarity		X			Clarification
FR-7722	695.3(B)	The requirements of this section were revised to include a back-up electric motor-driven fire pump supplied by an independent normal source to the existing exceptions to Section 695.3(B)(1) and 695.3(B)(2). Section 9.3.3 of NFPA 20 permits this system arrangement in lieu of multiple sources for a fire pump supply.		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7729	695.3(C)(3)	This section was revised to clarify the qualifications for those providing selective coordination and the necessary documentation		X			Clarification
SR-7526	695.3(C)(3)	Revised for clarity		X			Clarification
FR-7672	695.4(B)(2)	Revised for clarity		X			Clarification
FR-7730	695.6(A)	Revised for clarity		X			Clarification
FR-7677	695.6(I)	Revised for clarity		X			Clarification
FR-7679	695.6(J)	Revised for clarity		X			Clarification
SR-7534	695.6(J)	Revised for clarity		X			Clarification
SR-7522	695.10	Fire pump controllers and transfer switches shall not be permitted to be reconditioned.		X			Clarification
FR-7732	695.14(F)	Revised for clarity		X			Clarification
SR-7523	695.14(F)	Revised for clarity		X			Clarification
	CHAPTER 7	**SPECIAL CONDITIONS**					
	Article 700	**Emergency Systems**					
FR-8093	700.2	Relocate definition to 100: Branch Circcuit to Emergency Systems		X			Clarification
FR-7503	700.3(B)	Revised for clarity		X			Clarification
FR-8898	700.3(F)	Revised for clarity		X			Clarification
SR-7616	700.32	Revised for clarity		X			Clarification
FR-7505	700.4	Revised for clarity		X			Clarification
SR-7665	700.4(B)	Revised for clarity		X			Clarification
FR-7507	700.5	Revised for clarity		X			Clarification
SR-7584	700.5(C)	Automatic transfer switches shall not be permitted to be reconditioned.		X			Safety
FR-7508	700.6(B)	Revised for clarity		X			Clarification
FR-7509	700.6(D)	Revised for clarity		X			Clarification
FR-8899	700.10(B)	Revised for clarity		X			Clarification
FR-7658	700.10(D)	Revised for clarity		X			Clarification
FR-8095	700.12	Revised for clarity		X			Clarification
SR-7605	700.12(I)(2)	Revised for clarity		X			Clarification
FR-7550	700.16	Revised for clarity		X			Clarification
SR-7607	700.16(B)	Revised for clarity		X			Clarification
SCR-23	700.16(B)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7561	700.23	Revised for clarity		X			Clarification
SR-7608	700.24	Revised for clarity		X			Clarification
FR-7564	700.24	Revised for clarity		X			Clarification
	Article 701	**Legally Required Standby Systems**					
FR-8900	701.1	Revised for clarity		X			Clarification
FR-7575	701.2	Revised for clarity		X			Clarification
FR-7576	701.4	Revised for clarity		X			Clarification
SR-7629	701.4(A)	Revised for clarity		X			Clarification
SR-7669	701.4(B)	Revised for clarity		X			Clarification
FR-7580	701.5	A new last sentence is added to clarify that meter mounted transfer switches are not permitted for use in legally required systems.		X			Safety
SR-7586	701.5(C)	Automatic transfer switches shall not be permitted to be reconditioned		X			Safety
FR-8864	701.12	Revised for clarity		X			Clarification
FR-8865	701.12(I)	A new first level subdivision is added to 701.12 clarify that a DC microgrid system that includes multiple sources and is separate from the normal source of supply is permitted as a legally required source.		X			Clarification
FR-7825	701.25, 701.26, 701.27	Revised for clarity		X			Clarification
FR-7826	701.3(B)	Revised for clarity		X			Clarification
SR-7619	701.32	Revised for clarity		X			Clarification
	Article 702	**Optional Standby Systems**					
FR-8901	702.1	Revised for clarity		X			Clarification
FR-7600	702.2	Revised for clarity		X			Clarification
FR-8599	705.3	Deleted					Clarification
FR-7603	702.4(A)	Revised for clarity		X			Clarification
FR-7606	702.4(B)	Revised for clarity		X			Clarification
SR-7580	702.4(B)(2)	Revised for clarity		X			Clarification
SR-7588	702.5	Transfer switches shall not be permitted to be reconditioned		X			Safety
SR-7600	702.5	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7830	702.5	A new paragraph is added to address the permitted use of meter mounted transfer switches.		X			Clarification
SR-7632	702.7	Revised for clarity		X			Clarification
	Article 705	**Interconnected Electric Power Production Sources**					
FR-8674	705	Sections have been deleted or incorporated into other sections of Article 705.		X			Clarification
SR-8198	705	Revised for clarity		X			Clarification
FR-8596	705.2	New Definition: Power Source Output Circuit		X			Clarification
SR-8228	705.6	Stating that equipment has a field evaluation does not guarantee that a field label is installed.		X			Safety
FR-8602	705.6	Revised for clarity		X			Clarification
FR-8603	705.10	Section 705.10 is revised to address the concern of providing a directory to locate all onsite power sources for a building and to standardize the placard locations		X			Safety
FR-8608	705.10	New Section: This revision addresses connections made by electric power production sources on the supply side of the service disconnecting means. Rather than making numerous references to Article 230 and Article 250, most of the requirements are specifically called out in the new 705.11.		X			Clarification
SR-8154	705.10	Revised for clarity		X			Clarification
SR-8155	705.11(B)	Revised for clarity		X			Clarification
SR-8156	705.11(C)	Conductor lengths in this section were chosen to address installations where equipment distances would be impractical or impossible to apply consistently. These lengths represent practical values that will allow suitable listed equipment to be installed in a manner that does not violate it's listing.		X			Safety
SR-8159	705.11(D)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-8176	705.11(E)	Stating that equipment has a field evaluation does not guarantee that a field label is installed. NFPA 791 includes a recommendation for a label to be installed but does not mandate it as quoted below. The process of applying a field label for field evaluated equipment is extremely important for AHJs.		X			Safety
SR-8178	705.11(F)	Equipment containing a power source disconnecting means rated 1000 volts or less shall be listed as suitable for use as service equipment.		X			Safety
FR-8902	705.12	Edited to clarify how panelboards with feed-through conductors shall be sized and how the feed-through conductors are sized.		X			Clarification
SR-8184	705.12	Revised for clarity		X			Clarification
SCR-03	705.12	Revised for clarity		X			Clarification
SR-8148	705.12(B)	Revised for clarity		X			Clarification
SCR-02	705.12(B)	Revised for clarity		X			Clarification
SR-8150	705.12(D)	Revised for clarity		X			Clarification
FR-8745	705.13	New Section: Power Control Systems		X			Clarification
SR-8151	705.13	Revised for clarity		X			Clarification
SR-8152	705.14	Revised for clarity		X			Clarification
FR-8683	705.150	Revised for clarity		X			Clarification
SR-8199	705.150	Revised for clarity		X			Clarification
FR-8687	705.160	Revised for clarity		X			Clarification
SR-8200	705.160	Revised for clarity		X			Clarification
SR-8229	705.170	Stating that equipment has a field evaluation does not guarantee that a field label is installed. NFPA 791 includes a recommendation for a label to be installed but does not mandate it as quoted below. The process of applying a field label for field evaluated equipment is extremely important for AHJs.		X			Safety
SR-8153	705.20	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8747	705.20, 705.21, 705.22	This revision uses a similar format to 110.31(D) which addresses equipment accessible to unqualified persons. There is a need to require, as a minimum, a tool to physically open these enclosures.		X			Safety
FR-8659	705.23	Deleted		X			Clarification
FR-8660	705.25	New Section: This new section is consistent with with revisions to 690.31 such that a multiconductor assembly is to be used in accordance with its listing.		X			Clarification
FR-8663	705.28	New Section: Existing 705.60 and 705.65 have been revised, consolidated and relocated into 705.28 and existing 705.30 to be consistent with Article 690.		X			Clarification
SR-8190	705.28	Revised for clarity		X			Clarification
FR-8964	705.30	Revised for clarity		X			Clarification
SR-8193	705.30	Revised for clarity		X			Clarification
FR-8664	705.31	This section has been revised and incorporated into new Section 705.11.		X			Clarification
FR-8665	705.32	Revised for clarity		X			Clarification
SR-8195	705.40	Revised for clarity		X			Clarification
FR-8750	705.40, 705.42	In the reorganization of Article 705, Sections 705.40 and 705.42 are combined. The text of 705.42 is modified to address all types of ac electrical systems and the loss of any phase in any ac system.		X			Clarification
SR-8196	705.45	New Section		X			Clarification
FR-8668	705.50	This section is removed as these requirements are better addressed by the individual electrical power production source articles such as Article 690.		X			Clarification
	Article 706	**Energy Storage Systems**					Clarification
FR-8956	706	Revised for clarity		X			Clarification
SR-7683	706.1	Revised for clarity		X			Clarification
SCR-24	706.1	Revised for clarity		X			Clarification
FR-8103	706.1	The scope is revised to provide clarity that an ESS can store and provide energy during normal operating conditions. Energy		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
		Storage Systems do not include a UPS or large battery system that is used only when power is lost to the building.					
FR-9008	706.2	The changes better define an Energy Storage System and provide clarification between an ESS and a UPS system or a large battery system that is used only when power is lost to the building.		X			Clarification
SR-7560	706.2	Deleted unused definitions		X			Clarification
FR-7857	706.3	The installation and maintenance of energy storage systems must be performed by persons trained specifically in the unique requirements and hazards of these systems.		X			Safety
FR-8922	706.4	Revised for clarity		X			Clarification
SR-7684	706.4	Revised for clarity		X			Clarification
FR-8923	706.5	Revised for clarity		X			Clarification
SR-7686	706.5	Revised for clarity		X			Clarification
FR-8924	706.6	New Section: The new requirement will call attention to the need for effective maintenance		X			Clarification
FR-8925	706.6	New Section: This new section provides prescriptive requirements for the determination of maximum voltage.		X			Clarification
FR-8942	706.7	A requirement is added for one-family and two-family dwellings, that a disconnecting means or its remote control shall be located at a readily accessible location outside the building, and a 10 ft. line-of-sight requirement for the disconnecting means and ESS is added			X	$ 500	Clarification
FR-8943	706.8	Revised for clarity		X			Clarification
SCR-25	706.8	Revised for clarity		X			Clarification
SR-7687	706.9	Revised for clarity		X			Clarification
FR-8944	706.10	Revised for clarity		X			Clarification
FR-8953	706.11	This revision combines subsections 706.11(A) and (B) for facilities with stand-alone systems for clarity and usability.		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7700	706.15(A)	This revision clarifies the requirements for locating the ESS disconnecting means.		X			Clarification
SR-7731	706.15(C)	Revised for clarity		X			Clarification
SR-7693	706.16	Revised for clarity		X			Clarification
SR-7698	706.20	Revised for clarity		X			Clarification
FR-8958	706.20(A)(1)	Revised for clarity		X			Clarification
FR-8960	706.20(A)(4)	Revised for clarity		X			Clarification
FR-8961	706.20(B)	Revised for clarity		X			Clarification
FR-8963	706.21	Revised for clarity		X			Clarification
SR-7703	706.21	Revised for clarity		X			Clarification
FR-7969	706.23(A)	Revised for clarity		X			Clarification
FR-8962	706.23(B)(3)	Revised for clarity		X			Clarification
SR-7704	706.31(F)	Revised for clarity		X			Clarification
FR-7976	706.40	Revised for clarity		X			Clarification
SR-7706	706 Part V	Revised for clarity		X			Clarification
SR-7707	706 Part VI	Revised for clarity		X			Clarification
	Article 708	**Critical Operations Power Systems (COPS)**					Clarification
FR-9001	708.1	Revised for clarity		X			Clarification
FR-8870	708.1	Revised for clarity		X			Clarification
FR-9000	708.2	Revised for clarity		X			Clarification
FR-7626	708.6(B)	Revised for clarity		X			Clarification
FR-7627	708.14	Revised for clarity		X			Clarification
FR-7628	708.20(A), 708.20(B)	Revised for clarity		X			Clarification
FR-8871	708.20(G)	Revised for clarity		X			Clarification
SR-7517	708.24(A)	Transfer equipment shall not be permitted to be reconditioned.		X			Safety
FR-8872	708.24(C)	New Section: Bypass Isolation Automatic Transfer Switches			X	Varies	Reliability
SR-7622	708.54	Revised for clarity					Clarification
	Article 710	**Stand-alone Systems**		X			
FR-8718	710.1	The scope was revised to address both standalone systems and modes of operation.		X			Clarification
SR-8202	710.1	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8720	710.2	New definition: Stand-Alone (Islanded) Mode		X			Clarification
SCR-04	710.2	Definition for Stand-Alone (Islanded) Mode moved to Article 100		X			Clarification
SR-8206	710.2	Revised for clarity		X			Clarification
FR-8721	710.6	New Section: The new section is consistent with other existing NEC requirements for plaques for on-site power sources.		X			Clarification
FR-8724	710.6	New Section: Moved from 690		X			Clarification
SR-8209	710.6	Stating that equipment has a field evaluation does not guarantee that a field label is installed. The process of applying a field label for field evaluated equipment is extremely important for AHJs.		X			Clarification
SR-8210	710.10	Where multiple sources supply the building, the plaque or directory shall be marked with the wording “CAUTION: MULTIPLE SOURCES OF POWER.”			X	$50	Safety
SR-8213	710.15	New language has been added to (B) and a new (D) to recognize that stand-alone systems often include three-phase applications.		X			Clarification
FR-8722	710.15(A), 710.15(B)	The revisions in (A) clarify that in a microgrid, multiple sources can operate in parallel to support the connected loads.		X			Clarification
FR-8725	710.15(C), 710.15(D), 710.15(E), 710.15(F)	The words “and isolated microgrid” were added to 710.15(C) to indicate that this section applies to both stand-alone systems and isolated microgrid systems.		X			Clarification
	Article 712	**Direct Current Microgrids**					
FR-8868	712.2	Revised for clarity		X			Clarification
FR-8867	712.2	Revised for clarity		X			Clarification
FR-7815	712.4	Revised for clarity		X			Clarification
FR-7839	712.10	A building supplied by a dc microgrid system shall have a permanent plaque or directory installed outside the building at each service equipment location or at an approved readily visible location.			X	$50	Safety

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7660	712.10(B)	Revised for clarity		X			Clarification
FR-7802	712.25	Revised for clarity		X			Clarification
FR-7807	712.34	Revised for clarity		X			Clarification
SR-7662	712.37	Revised for clarity		X			Clarification
SR-7663	712.52(B)	Revised for clarity		X			Clarification
SR-7664	712.55	Revised for clarity		X			Clarification
FR-8873	712.57	Revised for clarity		X			Clarification
FR-7817	712.65	Revised for clarity		X			Clarification
FR-8866	712.72	Revised for clarity		X			Clarification
	Article 720	**Circuits and Equipment Operating at Less Than 50 Volts**					
FR-8776	720.2	Revised for clarity		X			Clarification
SR-7923	720.2	Revised for clarity		X			Clarification
	Article 725	**Class 1, Class 2, and Class 3 Remote-Control, Signalling, and Power-Limited Circuits**					
SR-7929	725.2	Revised for clarity		X			Clarification
FR-8779	725.2	New Definition: Cable Bundle		X			Clarification
FR-8790	725.2	New Definition: Nominal Current		X			Clarification
FR-8793	725.3	Revised for clarity		X			Clarification
SR-7947	725.3(P)	Revised for clarity		X			Clarification
SR-7936	725.3(C)	Revised for clarity		X			Clarification
SCR-75	725.3(C)	Revised for clarity		X			Clarification
FR-8879	725.3(D)	Revised for clarity		X			Clarification
SR-7938	725.3(D)	Revised for clarity		X			Clarification
FR-8800	725.3(E)	Revised for clarity		X			Clarification
FR-8799	725.3(G)	Revised for clarity		X			Clarification
FR-8812	725.3(M)	Revised for clarity		X			Clarification
SR-8032	725.3(M)	Revised for clarity		X			Clarification
FR-8926	725.3(N)	Revised for clarity		X			Clarification
FR-8814	725.3(N)	Revised for clarity		X			Clarification
FR-8819	725.24	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact								
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8994	725.48(B)(1)	Class 1 circuits shall be permitted to be installed together with the conductors of electric light, power, non–power-limited fire alarm, and medium power network-powered broadband communications circuits where separated by a barrier.		X			Combine data and power
SR-7958	725.48(B)(1)	Revised for clarity		X			Clarification
FR-8835	725.121(A)	Revised for clarity		X			Clarification
SR-7960	725.121(A)	Revised for clarity		X			Clarification
SR-7967	725.121(C)	Revised for clarity		X			Clarification
FR-8859	725.121(C)	There are several proposed revisions to Article 725 to accommodate circuits that transmit power and data to a powered device. NEC code cycle were intended to apply to high-density multi-port power sources, such as Power over Ethernet switches.		X			Combine data and power
FR-8862	725.135(B)	Revised for clarity		X			Clarification
FR-8927	725.135(E)	Revised for clarity		X			Clarification
FR-8928	725.135(K)	Revised for clarity		X			Clarification
FR-8929	725.135(L)	Revised for clarity		X			Clarification
FR-8930	725.135(M)	Revised for clarity		X			Clarification
FR-8931	725.136(I)	Revised for clarity		X			Clarification
FR-8863	725.139(D)(1)	Revised for clarity		X			Clarification
FR-8941	725.144	New Informational Note No. 5 is added since PoE lighting is a very important application covered by 725.144. The referenced standard provides useful information for the installers of PoE lighting systems.		X			Combine data and power
SR-7980	725.144	Revised for clarity		X			Clarification
FR-8932	725.144(A)	The new text provides a clear exception to widely deployed systems, supplying power at current levels that the UL Fact Finding Report on Power over Local Area Network Type Cables (4-Pair Data / Communications Cables), dated September 25,2015 , found no cause for concern.		X			Combine data and power

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7973	725.144(A)	Revised for clarity		X			Clarification
FR-8934	725.144(B)	Revised for clarity		X			Clarification
SR-7975	725.144(B)	Revised for clarity		X			Clarification
FR-8945	725.154	Revised for clarity		X			Clarification
FR-8996	725.179(F)(2)	Revised for clarity		X			Clarification
FR-8935	725.179(G)	Revised for clarity		X			Clarification
FR-8936	725.179(I)	Revised for clarity		X			Clarification
FR-8937	725.179(J)	Revised for clarity		X			Clarification
FR-8876	725.179(J)	Revised for clarity		X			Clarification
SR-7990	725.179(K)	Revised for clarity		X			Clarification
	Article 727	**Instrumentation Tray Cable: Type ITC**					
SR-7995	727.2	Revised for clarity		X			Clarification
FR-8881	727.8	Revised for clarity		X			Clarification
	Article 728	**Fire-Resistive Cable Systems**					
SR-8000	728.2	Revised for clarity		X			Clarification
FR-8997	728.4	Revised for clarity		X			Clarification
SR-8001	728.60	Revised for clarity		X			Clarification
	Article 750	**Energy Management Systems**					
FR-8743	750.2	Revised for clarity		X			Clarification
FR-8869	750.2	Revised for clarity		X			Clarification
	Article 760	**Fire Alarm Systems**					
SR-8003	760.2	Revised for clarity		X			Clarification
SR-8034	760.3(L)	Revised for clarity		X			Clarification
SCR-73	760.3(L)	Revised for clarity		X			Clarification
FR-8995	760.3(N)	Temperature Limitations of Power-Limited and Non–Power-Limited Fire Alarm Cables		X			Clarification
SR-8004	760.3(O)	New Section: Identification of Equipment Grounding Conductors		X			Clarification
FR-8882	760.24(A)	Revised for clarity		X			Clarification
FR-8883	760.24(A)	Revised for clarity		X			Clarification
SR-8008	760.24(A)	Revised for clarity		X			Clarification
SR-8009	760.36	New Section: Surge Protection, if used, shall be listed		X			Clarification
SCR-74	760.36	Delete new section		X			Clarification
FR-8885	760.121(B)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-8886	760.135(B)	Revised for clarity		X			Clarification
FR-8950	760.154	Revised for clarity		X			Clarification
FR-8998	760.176(F)	Revised for clarity		X			Clarification
FR-8887	760.176(G)	Revised for clarity		X			Clarification
FR-8888	760.179(C)	Revised for clarity		X			Clarification
FR-8999	760.179(G)	Revised for clarity		X			Clarification
FR-8889	760.179(I)	Revised for clarity		X			Clarification
	Article 770	**Optical Fiber Cables**					
FR-7530	770	Revised for clarity		X			Clarification
FR-7535	770.2	Revised for clarity		X			Clarification
FR-7567	770.24	Revised for clarity		X			Clarification
FR-7581	770.24	Revised for clarity		X			Clarification
SCR-40	770.24	Revised for clarity		X			Clarification
SR-7720	770.49	Revised for clarity		X			Clarification
FR-7582	770.49	Revised for clarity		X			Clarification
FR-7583	770.93	Revised for clarity		X			Clarification
FR-7585	770.100(B)	Revised for clarity		X			Clarification
FR-7584	770.100(B)(1)	Revised for clarity		X			Clarification
FR-7597	770.110	Revised for clarity		X			Clarification
SR-7722	770.110	Revised for clarity		X			Clarification
FR-7601	770.110(A)	Revised for clarity		X			Clarification
FR-7586	770.110(C)	Revised for clarity		X			Clarification
FR-7558	770.113(A)	Revised for clarity		X			Clarification
FR-7608	770.113(B)	Revised for clarity		X			Clarification
FR-7610	770.113(C)	Revised for clarity		X			Clarification
SR-7747	770.113(C)	Revised for clarity		X			Clarification
SR-7723	770.114	Revised for clarity		X			Clarification
SR-7725	770.133	Revised for clarity		X			Clarification
FR-7615	770.133(A)	Conductive optical fiber cables contained in an armored or metal-clad–type sheath and nonconductive optical fiber cables shall be permitted to occupy the same cable tray or raceway with conductors for electric light, power, Class 1, non–power-limited fire alarm, Type ITC, or medium-power network-		X			Convenience

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
		powered broadband communications circuits operating at 1000 volts or less.					
FR-7633	770.179	Revised for clarity		X			Clarification
SR-7726	770.179(G)	Revised for clarity		X			Clarification
	CHAPTER 8	**COMMUNICATION SYSTEMS**					
	Article 800	**General Requirements for Communications Systems**					
FR-7644	800	Delete informational note		X			Clarification
FR-8042	800	Revised for clarity		X			Clarification
SCR-43	800, 805, 820, 830	Revised for clarity		X			Clarification
SR-7539	800.1, 805,1, 820.1, 830.1, 840.1	Revised for clarity		X			Clarification
FR-7656	800.2	Revised for clarity		X			Clarification
SR-7569	800.2	Revised for clarity		X			Clarification
SR-7595	800.2	Revised for clarity		X			Clarification
SR-7562	800.2, 805.2, 810.2, 830.2, 840.2	Revised for clarity		X			Clarification
FR-7665	800.3	Revised for clarity		X			Clarification
SR-7509	800.3(G)	Revised for clarity		X			Clarification
FR-7669	800.3(H)	Revised for clarity		X			Clarification
SR-7611	800.3, 805.2, 820.3, 830.3, 840.3	Revised for clarity		X			Clarification
FR-7683	800.24	Revised for clarity		X			Clarification
SR-7637	800.24	Revised for clarity		X			Clarification
SCR-41	800.24	Revised for clarity		X			Clarification
SR-7734	800.44, 805.44, 820.44, 830.44, 840.44, 840.45, 840.46	Revised for clarity		X			Clarification
FR-7691	800.47(B)	Revised for clarity		X			Clarification
SR-7661	800.48	Revised for clarity		X			Clarification
FR-7698	800.49	Revised for clarity		X			Clarification
FR-7709	800.53	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SCR-42	800.53	Revised for clarity		X			Clarification
SR-7679	800.80	Revised for clarity		X			Clarification
FR-7713	800.90(A)	Revised for clarity		X			Clarification
FR-7714	800.93	Revised for clarity		X			Clarification
FR-7715	800.100(B)(1)	Revised for clarity		X			Clarification
FR-7717	800.100(B)(2)	Revised for clarity		X			Clarification
FR-7716	800.100(B)(2)	Revised for clarity		X			Clarification
SR-7690	800.100, 805.100, 820.100, 830.100, 840.100	Revised for clarity		X			Clarification
SR-7692	800.106, 805.106, 820.106, 830.106, 840.106	Revised for clarity		X			Clarification
FR-7741	800.110	Revised for clarity		X			Clarification
SR-7696	800.110, 805.110, 820.110, 830.110, 840.110	Revised for clarity		X			Clarification
FR-7748	800.113(B)	Revised for clarity		X			Clarification
FR-7752	800.113(C)	Revised for clarity		X			Clarification
FR-7757	800.113(J)	Revised for clarity		X			Clarification
FR-7760	800.113(K)	Revised for clarity		X			Clarification
FR-7762	800.113(L)	Revised for clarity		X			Clarification
SR-7709	800.113, 805.113, 820.113, 830.113, 840.113	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7763	800.133(A)(1)	This revision corrects a longstanding issue with reclassification of circuits within the same cable. A Class 2 or Class 3 power circuit is defined by its source and should not be reclassified based on the type of cable used.		X			Clarification
FR-7769	800.154	Revised for clarity		X			Clarification
SCR-66	800.154	Revised for clarity		X			Clarification
SR-7717	800.154, 805.154, 820.154, 830.154, 840.154	The redundant requirements in 805.154, 820.154, and 830.154 are deleted and inserted in 800.154 as general requirements.		X			Clarification
FR-7779	800.170	Revised for clarity		X			Clarification
FR-8012	800.179	Revised for clarity		X			Clarification
FR-7790	800.179	Revised for clarity		X			Clarification
FR-7786	800.179(G)	New Section: Communications cables are already permitted as substitutes for Class 2 and Class 3 cables. LP cables are a specific type of Class 2, Class 3, and communications cable and do not affect the substitution hierarchy. The vast majority of LP cables are listed as communications cables. This revision recognizes these facts and explicitly permits these cable types as substitutes for Class 2 and Class 3 LP cables.		X			Clarification
SR-7741	800.179, 805.179, 820.179, 830.179	The redundant requirements in 805.179, 820.179, and 830.179 are deleted and added to 800.179 as general requirements.		X			Clarification
FR-8014	800.182(A)	Revised for clarity		X			Clarification
FR-7793	800.182(C)	Revised for clarity		X			Clarification
	Article 805	**Communications Circuits**					
FR-7512	800	Reorganize common elements of chapter 8 into new article 805		X			Clarification
SR-7581	805.2, 800.2, 830.2	Revised for clarity		X			Clarification
SR-7599	805.2, 820.2	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
SR-7592	805.2, 820.2, 830.2	Revised for clarity		X			Clarification
SR-7621	805.21, 820.21, 830.21, 840.21	Revised for clarity		X			Clarification
SR-7642	805.21, 820.24	Revised for clarity		X			Clarification
SR-7646	805.25, 520.25, 830.25	Revised for clarity		X			Clarification
SR-7647	805.26, 820.26, 830.26	Revised for clarity		X			Clarification
SR-7648	805.27, 820.27, 830.27, 840.27	Revised for clarity		X			Clarification
SR-7748	805.47	Revised for clarity		X			Clarification
SR-7667	805.49, 820.49, 830.49, 840.49	Revised for clarity		X			Clarification
SR-7672	805.53	Revised for clarity		X			Clarification
SR-7744	805.180, 820.180, 830.180, 840.180	Revised for clarity		X			Clarification
SR-7746	805.182	The requirements are moved from Article 805 to Article 800 as general requirements.		X			Clarification
	Article 810	**Radio and Television Equipment**					
FR-7929	810	Revised for clarity		X			Clarification
FR-7933	810.21(A)	Revised for clarity		X			Clarification
FR-7935	810.21(F)(2)	Revised for clarity		X			Clarification
	Article 820	**Community Antenna Television and Radio Distribution Systems**					
FR-7938	820	Delete informational note		X			Clarification
FR-7943	820.2	Revised for clarity		X			Clarification
FR-7944	820.3	Revised for clarity		X			Clarification
FR-7947	820.24	Revised for clarity		X			Clarification
FR-7946	820.27	New Section: Temperature Limitations of Wires and Cables.		X			Clarification
SCR-44	820.44(A)	Revised for clarity		X			Clarification
FR-7948	820.49	Revised for clarity		X			Clarification
FR-7949	820.100(B)(2)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7954	820.110	Revised for clarity		X			Clarification
FR-7956	820.113(B), 820.113(C)	Revised for clarity		X			Clarification
SCR-67	820.133(A)(1)	Revised for clarity		X			Clarification
FR-7829	820.154	Revised for clarity		X			Clarification
FR-8016	820.179(D)	Revised for clarity		X			Clarification
	Article 830	**Network-Powered Broadband Communications Systems**					
FR-9005	830	Revised for clarity		X			Clarification
FR-7803	830.2	Revised for clarity		X			Clarification
FR-7813	830.3	he new text is added to reinforce the independence of Article 830.		X			Clarification
FR-7832	830.24	Revised for clarity		X			Clarification
SR-7653	830.24	Revised for clarity		X			Clarification
FR-7816	830.27	New Section: Temperature Limitations of Wires and Cables.		X			Clarification
SCR-68	830.3(B)	Revised for clarity		X			Clarification
FR-7833	830.47(C)	Revised for clarity		X			Clarification
FR-7838	830.49	Revised for clarity		X			Clarification
FR-7841	830.100(B)	Revised for clarity		X			Clarification
FR-7844	830.110	Revised for clarity		X			Clarification
FR-7850	830.113(B), 830.113(C)	Revised for clarity		X			Clarification
SCR-69	830.133	Revised for clarity		X			Clarification
FR-7853	830.179	Revised for clarity		X			Clarification
	Article 840	**Premises-Powered Broadband Communications Systems**					
FR-7856	840.2	New Definition: Broadband		X			Clarification
FR-7859	840.2	New Definition: Premises-Powered		X			Clarification
FR-7854	840.2	Revised for clarity		X			Clarification
FR-8117	840.2	Revised for clarity		X			Clarification
FR-7881	840.3	Revised for clarity		X			Clarification
SCR-70	840.3(B)	Revised for clarity		X			Clarification
FR-7887	840.27	New Section: Temperature Limitations of Wires and Cables.		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
FR-7888	840.44	Revised for clarity		X			Clarification
FR-7889	840.94	New Section: Circuits are being installed by utilities or service providers that provide power to exterior equipment. These circuits are derived from the premises power to avoid having to run copper cable to a location, establish a meter point, or provide batteries. Such circuits are potentially exposed to lightning events and/or electric power faults and require the same protection and grounding as other aerial, buried, or underground communications cables entering the building.		X			Clarification
FR-7891	840.102	New Section: Circuits are being installed by utilities or service providers that pr+E2271:E2298ovide power to exterior equipment. These circuits are derived from the premises power to avoid having to run copper cable to a location, establish a meter point, or provide batteries. Such circuits are potentially exposed to lightning events and/or electric power faults and require the same protection and grounding as other aerial, buried, or underground communications cables entering the building		X			Safety
SR-7749	840.101(A)	Revised for clarity		X			Clarification
SR-7750	840.102	Revised for clarity		X			Clarification
FR-7892	840.160	Installing communications cables in compliance with 725.144 shall not be required for listed 4-pair communications cables where the rated current does not exceed 0.3 amperes in any conductor 24 AWG or larger		X			Clarification
SR-7751	840.160	Revised for clarity		X			Clarification
FR-7919	840.170(C)	Revised for clarity		X			Clarification
SR-7753	840.170(C), 840.170(D)	Revised for clarity		X			Clarification

Table 8. 2020 NEC Changes Cost Impact							
CODE CHANGE #	2020 NATIONAL ELECTRIC CODE CHANGE SUMMARY		NEC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
			Decrease	None	Increase		
Sub Code:							
	CHAPTER 9	**TABLES**					
SR-7563	Table 1, Note 4	Table 1 Note 4 revised		X			
FR-8330	Table 1, Note 2	Revised for clarity		X			Clarification
FR-8331	Table 5A	Revised for clarity		X			Clarification
FR-8367	Table 10	Revised for clarity		X			Clarification
	Annex A	**Product Safety Standards**					
FR-8759	Annex A	Revised for clarity		X			Clarification
SR-7906	Annex A	Revised for clarity		X			Clarification
	Annex B	**Application Information for Ampacity Calculation**					
FR-7968	Annex B	Application Information for Ampacity Calculation		X			Clarification
SCR-50	Annex B	Revised for clarity		X			Clarification
SR-7743	Annex B	Revised for clarity		X			Clarification
	Annex C	**Conduit, Tubing, and Cable Tray Fill Tables**					
SR-7575	Annex C	Revised for clarity		X			Clarification
FR-8100	Annex C	The title was revised to accommodate the addition of the Cable Tray Tables to Annex C		X			Clarification
FR-8326	Annex C	Revised for clarity		X			Clarification
	Annex F	**Types of Construction**					
FR-7640	Annex F	Revision Part I		X			Clarification
FR-7641	Annex F	Revision Part II		X			Clarification
	Annex H	**Administration and Enforcement**					
FR-8760	Annex H	Administration and Enforcement		X			Clarification
FR-8761	80.2	Revised for clarity		X			Clarification
	Annex I	**Recommended Tightening Torqe Tables**					
FR-8762	Annex I	Recommended Tightening Torque Tables		X			Clarification

APPENDIX I

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Chapter 2: Definitions						
CCC IBC4-20, G1-18	Modified: The definition of a "Atrium" has changed.		X			Improves the definition of atrium.
FS62-18	Modified: The definition of "Ceiling Radiation Damper" has changed to show they can be utilized in static or dynamic systems.		X			Improves the definition of ceiling radiation damper.
ADM3-19 Part 1	Modified: The definition of "Change of Occupancy" has changed to narrow the scope where there is no occupancy change takes place.		X			Improves the definition of change of occupancy.
G5-18 PART 1	Modified: The definition of a "Emergency Escape and Rescue Opening" has changed to clarify that it is exterior.		X			Improves the definition of emergency escape and rescue opening.
FS53-18	Modified: The definition of "F Rating" has changed to accommodate new perimeter fire containment system requirements.		X			Improves the definition of F rating.
G34-18	New: A definition was added for "Fire Protective Curtain Assembly."		X			Necessary addition.
G10-19	New: A definition was added for "Fire-Retardant-Treated Wood."		X			Necessary addition.
G4-19 Part 1	New: A definition was added for "Glass Mat Gypsum Panel."		X			Necessary addition.
G4-18	Modified: The definition for "Grade Floor Emergency Escape and Rescue Opening" has been changed to coordinate with new measurement requirements.		X			Improves the definition of grade floor Emergency escape and rescue opening.
G5-19	Modified: The definition of "Gypsum Board" has changed to show its more generic usage.		X			Improves the definition of gypsum board.
G5-19	Modified: The definition of "Gypsum Panel Product" has changed and identified the appropriate code requirements.		X			Improves the definition of gypsum panel product.
G4-19 Part 1	New: A definition was added for "Gypsum Sheathing".		X			Necessary addition.
G4-19 Part 1	New: A definition was added for "Gypsum Wallboard".		X			Necessary addition.
S110-19	New: A definition was added for "Impact Protective System".		X			Necessary addition.
S168-19	New: A definition was added for "Individual Truss Member".		X			Necessary addition.
	New: A definition was added for "Life Safety Systems".		X			Necessary addition.

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
G108-18	New: A definition was added for "Mass Timber". Needed for mass timber construction.		X			Necessary addition.
G39-18	New: A definition was added for "Mechanical-Access Enclosed Parking Garage".		X			Necessary addition.
FS2-19	New: A definition was added for "Nailable Substrate".		X			Necessary addition.
G108-18	New: A definition was added for "Noncombustible Protection (For Mass Timber)". Needed for mass timber construction.		X			Necessary addition.
G136-18	Modified: The definition of a "Penthouse" has changed to add stairs to it.		X			Improves the definition of penthouse.
FS53-18	New: A definition was added for "Perimeter Fire Containment System" to provide a simple phrase to use when describing the method of protecting the void at the intersection of an exterior curtain wall assembly and a fire-resistance-rated floor or floor/ceiling assembly.		X			Necessary addition.
N/A	Modified: The name for "Play Structure" has changed. Removed mention of children to allow for play structures serving all ages.		X			Improves the name of play structure.
G10-19	New: A definition was added for "Preservative-Treated Wood". Clarification to remove word "conditioned" from definition.		X			Necessary addition.
G103-18	Modified: The definition of a "Primary Structural Frame" has changed and updated to note newer technologies.		X			Improves the definition of the primary structural frame.
G48-18	New: A definition was added for "Puzzle Room".		X			Necessary addition.
G103-18	Modified: The definition of a "Secondary Structural Members" has changed and updated to note newer technologies.		X			Improves the definition of the secondary structural members.
FS38-18	Modified: The definition of a "Smoke Compartments" has changed and clarifies isolating interior areas.		X			Improves the definition of the smoke compartments members.
CCC IBC2-20	Modified: The definition of "Soft Contained Play Equipment Structure" has changed. Removed mention of children to allow for play structures serving all ages.		X			Improves the definition of soft contained play equipment structure.
FS60-18	New: A definition was added for "Terminated Stops".		X			Necessary addition.

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
G10-19	Modified: The definition of "Treated Wood" has changed. Clarification to remove word "conditioned" from definition.		X			Improves the definition of treated wood.
G12-18	Modified: The definition of "Vapor Permeable" has changed. Adding a test procedure that is more appropriate for some products		X			Improves the definition of vapor permeable.
G108-18	Modified: The definition of "Wall, Load-Bearing" has been changed. Added reference to Mass timber.		X			Improved the definition of load-bearing wall.
Chapter 3: Occupancy Classification and Use						
Section 306: Factory Group F						
G17-18, G18-18	306.2 Modified: Energy storage systems and water/sewer treatment facilities are considered a Group F-1 occupancy.		X			Clarifies and amends the list of moderate-hazard factory industrial occupancies.
Section 307: High-Hazard Group H						
F276-18, F293-18	307.1.1 Modified: Distilling or brewing of beverages or the storage of beer, distilled spirits, and wines and barrels and casks conforming to the IFC are not considered Group H.		X			These uses are not limited in quantity and will not be considered Group H. This is consistent with previous NFPA approaches
Section 311: Storage Group S						
F276-18	311.2 Modified: Storage of alcohol beverages over 16% are considered a Group S-1 occupancy		X			Clarifies and amends the list of moderate-hazard storage occupancies.
F276-18, G13-18	311.3 Modified: Storage of alcohol beverages up to and including 16% (regardless of container material) are considered a Group S-2 occupancy		X			Clarifies and amends the list of low-hazard storage occupancies.
Chapter 4: Special Detailed Requirements Based on Occupancy and Use						
Section 403: High-Rise Buildings						
G27-18, G13-19	403.2 Modified: Multiple section numbers are revised as a section was removed.		X			Clarification without code intent change.
G27-18, G13-19	403.2.2.1 Modified: Section title revised to clarify soft body impact wall assembly materials. Wall assembly nomenclature revised to "panels".		X			Clarification of the application of C1629/ C1629M without code intent change.
G27-18, G13-19	403.2.2.2 Modified: Section title revised to clarify hard body impact wall assembly materials. Wall assembly and construction board nomenclature revised to "panels".		X			Clarification of the application of C1629/ C1629M without code intent change.

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
F110-18	403.3 Modified: Open parking garages are removed from being exempt from sprinkler systems.			X	$150,000 per 50,000 sq ft	Open parking garages over 48,000 sqft. require a sprinkler system.
G28-18	403.3.2 Modified: Fire pumps are required at 120 feet in building height for Type IVA and IVAB mass timber construction.		X			Necessary revision based on mass timber changes.
F45-18	403.4.5 Modified: Section title and description nomenclature modified from “emergency responder radio coverage” to “two-way emergency communication coverage”.		X			Change allows correlation with the IFC.
F196-18	403.4.8.2 Modified: Additional protection methods are provided to protect fuel line piping.		X			Design flexibility change by providing additional option.
G29-18	403.5.6 Removed: Emergency escape and rescue exception is removed for consistency.		X			Openings never required in high-rises, so unnecessary code requirement.
Section 404: Atriums						
G30-18, G31-18	404.1 Modified: This section was rewritten to clarify general scope.		X			This is intended as a clarification.
G32-18	404.5 Modified: A new exception is provided for atriums with more than two stories, which may not require a smoke control system when separated from all upper floors by shaft construction.	X			$250,000 or more depending on atrium alternates and shaft assembly	Design flexibility change to utilize a natural smoke sink in lieu of an active smoke control system.
G33-18	404.6 Modified: Additional exceptions are provided to address escalators and exit access stairways/ramps that penetrate the required horizontal assembly.	X			$250,000	Design flexibility change to avoid having to provide draft curtains and closely spaced sprinklers/ limiting opening if part of atrium.
G31-18	404.9 Modified: Exit access travel distances rules are relocated to 1017.3.2 for atriums.		X			Consolidates atrium and means of egress requirements in Chapters 4 and 10, respectively.
G35-18	404.10 New: New requirements are provided for interior exit stairways in an atrium.		X			Atrium interior exit stairways must meet multiple requirements to be considered exits. Added clarification for original code requirements.

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
G31-18, G35-18	404.11 Modified: Interior exit stairway discharge requirements are relocated to Section 1028 for atriums.		X			Consolidates atrium and means of egress requirements in Chapters 4 and 10, respectively.
Section 406: Motor-Vehicle-Related Occupancies						
G36-18	406.2.4 Modified: The exception for S-2 parking garages are not required to have sloped floor surfaces removed.		X			Sloping floors for the vehicle areas of parking garages has been reinstated for Group S-2 occupancies.
Section 407: Group I-2						
G42-18	407.3.1.1 New: Group I-2 corridor doors not requiring a fire protection rating have new requirements.		X			Expands the smoke-resistance criteria for Group I-2 corridor doors to match existing CMS criteria.
G43-18	407.4.4.1 Modified: Exit access through Group I-2 care suites has been revised.		X			Design flexibility change and has better consistency with CMS standards.
G48-18, G44-18	407.4.4.3 Modified: Group I-2 care suite access to corridors has been revised.		X		$10/ sq ft	Design flexibility change and has better consistency with CMS standards.
G46-18	407.6.1 New: The activation of automatic-closing doors in defined in Group I-2 occupancies.		X			Activation must occur upon fire alarm or automatic sprinkler activation.
Section 411: Special Amusement Areas						
G48-18	411.5 New: New requirements are provided for puzzle rooms.			X		Necessary revision based on puzzle rooms becoming more popular.
Section 414: Hazardous Materials						
F288-18	414.2.3 Modified: Fire walls complying with Section 706 shall be considered separate buildings for purposes of number of control areas.	X				Design flexibility change.
Section 420: Groups I-1, R-1, R-2, R-3, and R-4						
G55-18, G56-18	Modified: Multiple section numbers are revised as a section was added.		X			Clarification without code intent change.
Section 422: Ambulatory Care Facilities						
G58-18	422.7 New: New requirements are provided for domestic cooking appliances in ambulatory care facilities.			X	$1,500 per average stovetop	Fire concerns for domestic cooking appliances are addressed.
Section 424: Play Structures						

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
G66-18	Modified: The section name was revised from "Children's Play Structures" to "Play Structures". This nomenclature is revised through the section.		X			Clarification without code intent change.
062 G66-18	424.2 Modified: A new requirement was provided for interior finishes for play structures exceeding 10 feet in height or 600 square feet in area.			X	Cost increase for materials depends highly on type of structure and materials	Interior finish must meet the requirements in Table 803.13.
G66-18, G68-18	424.5 Modified: The area limitation was revised to 600 square feet in area for play structures without demonstrating adequate life safety approved by the building official.	X			$5,000 for special inspection & AHJ coordination	Design flexibility change.
G66-18	424.5.1 New: Play structures exceeding the area or height limitation shall comply with Chapter 16.			X	Approximately 2-3% of play structure construction cost. Since play structures vary greatly in size and complexity, cost is variable.	Special investigation for play structures exceeding 600 square feet or 10 feet in height must include a structural design analysis.
Chapter 5: General Building Heights and Areas						
Section 503: General Building Height and Area Limitations						
G73-18, G136-18	503.1.4 Modified: Occupied roofs were clarified to not be included in the building height/number of stories. Exception 1 was clarified to require emergency voice/alarm clarification system notification for the occupied roof where required for the building.		X			Provides an Clarification without code intent change.
Section 504: Building Height and Number of Stories						
G75-18	Table 504.3 Modified: This table was modified to include new requirements for Type IVA, Type IVB, and Type IVC construction to determine allowable building height in feet above grade plane.		X			Necessary revision based on mass timber changes.
G77-18	504.4 Modified: Table 504.4 refers to stories above grade plane.		X			Provides an Clarification without code intent change.

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
G78-18, G80-18, G81-18	Table 504.4 Modified: This table was modified to include new requirements for Type IVA, Type IVB, and Type IVC construction to determine number of stories above grade plane. Stories for select Group S construction types were increased.		X			Necessary revision based on mass timber changes.
Section 506: Building Area						
G81-18, G84-18	Table 506.2 Modified: This table was modified to include new requirements for Type IVA, Type IVB, and Type IVC construction to determine allowable area factor in square feet. Allowable area factor for 1 story sprinklered Group I-3 Construction Type IIA was increased.		X			Necessary revision based on mass timber changes.
G85-18	506.2.1 Modified: This section was simplified to single-occupancy buildings for determining allowable area in square feet.		X			Clarification without code intent change.
G85-18	506.2.2 Modified: This section was simplified to mixed-occupancy buildings for determining allowable area in square feet.		X			Clarification and reduces number of options for designers to sift through without code intent change.
G86-18	506.3.2 Modified: Modified language was provided as new methods are used to calculate the frontage increase factor in the following section.		X			Necessary change based on how the frontage increase factor is calculated.
G86-18	506.3.3 Modified: The frontage increase factor is based on a table in lieu of the equation previously used.			X		Calculation of frontage factor simplified. However, weighted average was removed so new resulting frontage increase factor can be slightly lower than previously calculated.
G86-18	506.3.3.1 New: The exception to 506.3.2 was moved to this section for Section 507 buildings frontage increase. The frontage increase factor for Section 507 Buildings is based on a table in lieu of the equation previously used.			X		Calculation of frontage factor has been simplified for Section 507 Buildings. However, the weighted average was removed so new resulting frontage increase factor will be lower.
Section 508: Mixed Use and Occupancy						

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
G90-18	508.1 Modified: Live/Work units are considered applicable to Section 508.		X			Clarification.
G88-18	Table 508.4 Modified: Dashed marks were replaced with their corresponding requirement.		X			Clarification without code intent change.
G89-18	508.4.4.1 Modified: Additional language was added for mass timber in fire barriers or horizontal assemblies.		X			Necessary revision based on mass timber changes.
078 G90-18	508.5 New: Live/work units, previously 419, was moved to Section 508.		X			Clarification with no change to technical requirements.
Section 509: Incidental Uses						
G92-18	Table 509.1 Modified: Stationary storage battery systems are removed from the incidental uses table. Section number changed to Table 509.1. All references to this table are changed accordingly.	X			$0.25 per sqft of separation wall by removing rating requirement	Mass timber incidental areas have no cost associated as they are new allowances, but by removing the stationary storage battery systems areas no longer need to meet 10% area limitation.
G89-18	509.4.1.1 New: New requirements for mass timber are provided for incidental use separations.		X			Necessary revision based on mass timber changes.
Section 510: Special Provisions						
G95-18	510.2 Modified: The exception to condition 3 has an Clarification. Additional requirements are provided to allow combustible construction for interior exit stairways in “podium” or “pedestal” buildings. All other subsequent numbers are revised appropriately.	X			30% savings by permitting wood on these floors	Provides allowance for combustible construction to be continued below podium as long as rating is 3 hours in podium eliminating need for transition from wood to steel.
G98-18	510.5 Modified: For Group R-1 and R-2 of Type IIIA construction has a height increase of 10 feet in Table 504.3 and one story in Table 504.4 instead of being increased to six stories and 75 feet.		X			Correction adds clarity and coordination with the Height and Area tables.
Chapter 6: Types of Construction						
Section 601: General						
FS18-18, G101-18, G102-18, G103-18, G108-18	Table 601 Modified: Additional Type IV fire-resistance ratings are provided for mass timber. A fire-resistance rating footnote was modified, and a new fire-resistance rating footnote was added based on heavy timber.		X			Necessary revision based on mass timber changes.

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	Building elements were clarified to be "structural" members.					
Section 602: Construction Classification						
G108-18	602.4 Modified: This section was nearly completely rewritten based on the addition of mass timber construction for Type IV construction.		X			Mass timber (separate from heavy timber) is a construction type allowable by code.
Section 603: Combustible Materials in Types I and II						
G112-18, G113-18, G114-18	603.1 Modified: Wood nailers for parapet flashing and roof cants are permitted as a combustible material. Group I-2 and ambulatory care cannot use fire-retardant-treated wood as fire partition for shaft enclosures. Group I-2 roof construction containing fire-retardant-treated wood must be covered by a Class A roof covering/assembly.		X			Common construction practice that is now clearly approved.
Chapter 7: Fire and Smoke Protective Features						
Section 703: Fire-Resistance Ratings and Fire Tests						
FS1-18	703.2 Modified: This section governs the fire-resistance rating for all building elements, components, or assemblies.		X			Clarification without code intent change.
FS1-18	703.2.1 New: This section governs fire-resistance ratings for tested assemblies		X			Clarification without code intent change.
FS1-18	703.2.2 Modified: This section governs fire-resistance ratings for analytical methods.		X			Clarification without code intent change.
FS1-18	703.2.3 New: Approved alternative methods for fire-resistance assemblies are relocated here.		X			Clarification without code intent change.
FS1-18, FS2-18, FS3-18	703.3.1 Modified: Section name revised to be Noncombustible materials. Additional materials can be proved to be noncombustible using ASTM E2652.		X			Design flexibility change.
FS5-18	703.6 New: Provides requirements to determine noncombustible protection time for mass timber.		X			Necessary revision based on mass timber changes.
FS6-18	703.7 New: Provides requirements for sealing adjacent mass timber elements.		X			Necessary revision based on mass timber changes.
Section 704: Fire-Resistance Ratings of Structural Members						

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
G103-18	704.4 Modified: Clarified members to be primary vs secondary structural members. Original intent remains the same.		X			Clarification without code intent change.
FS8-18	704.6.1 New: Secondary attachments to structural members require 12 inches of fire proofing.			X	$2 per structural member	Improves protection of primary structural members and is a best practice.
Section 705: Exterior Walls						
FS14-18	Table 705.2 Modified: Description of calculation for FSD was revised and simplified.		X			Clarification without code intent change.
FS16-18	705.2.3 Modified: This section was reorganized to provide clarity. Section name revised to Projection protection.		X			Clarification without code intent change.
FS18-18	705.5 Modified: Exterior walls are based on either Table 601 due to construction type or Table 705.5 due to fire separation distance.		X			Provides an Clarification without code intent change.
FS18-18, G108-18	Table 705.5 Modified: Table 602 has been moved to Section 705 and mass timber construction has been added to the table. All references to this table are changed accordingly.		X			Necessary revision based on mass timber changes and to consolidate exterior wall rating requirements.
Section 706: Fire Walls						
FS22-18	706.1.1 Modified: Exception 2 clarifies party walls are applicable to the exception. The building official nomenclature has been revised.		X			Clarification without code intent change.
FS24-18	706.6.1 Modified: This section has been rewritten to add clarity to the stepped building approach.		X			Clarification without code intent change.
Section 707: Fire Barriers						
E102-18, FS26-18	707.4 Modified: Exterior walls where part of a required fire-resistance-rated exit passageway are included. The section and exception were slightly reorganized. Exterior walls are required to be fire-resistance rated if enclosing energy storage systems.		X			Necessary clarification and coordinates exterior wall requirements for exit passageway and exit stairway.
FS27-18	707.5 Modified: A new exception for fire barrier continuity is provided for exit passageway enclosures to be “capped” with rated ceiling.	X				Clarification for a typical approach for exit passageway protection.
Section 708: Fire Partitions						
FS32-18, FS33-18	708.1 Modified: Fire partition separations at dwelling and sleeping units in Group R-1 and		X			Coordinated IBC requirements, provides

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	R-2; exit discharge vestibule vestibules; and walls separating ambulatory care facility for adjacent spaces corridors, or tenants must comply with Section 708.					clarification for better enforcement and application.
FS37-18	708.4.1 Modified: Supporting construction exception includes fire partition separations at ambulatory care facilities.	X			$20,000 per 20 x 20 sq ft structural bay	Now supporting construction for 1-hr. partitions utilized to separate ambulatory care facilities is not required to be rated.
Section 709: Smoke Barriers						
FS38-18	Modified 709.4.1: Smoke barrier assemblies separating smoke compartments are clarified to separate interior areas of the building.		X			This is a design flexibility change.
Section 710: Smoke Partitions						
G42-18	Modified 710.5.2.1: Doors may have louvers in smoke partitions where allowed in Section 407.3.1.1.		X			Design flexibility change.
FS39-18	New 710.5.3: New pass-through openings are allowed in Group I-2, Condition 2 occupancies.		X			Design flexibility change.
Section 712: Vertical Openings						
G1-18, G31-18	712.1.7 Modified: This section was completely rewritten for atriums. Substance change includes Exception 2, where balconies or stories within Group A-1, A-4 and A-5 and mezzanines that comply with Section 505 are not considered a story as it applies to atriums.		X			Clarification for better enforcement and application. Entire atrium definition has been updated and coordinated to centralize requirements.
Section 713: Shaft Enclosures						
FS41-18	713.12 Modified: This section has been completely rewritten for clarity of shaft top enclosures.		X			Clarification for better enforcement and application.
FS44-18	713.13 Modified: Recycling chute have the same requirements as waste and linen chutes. Recycling nomenclature was added to all applicable sections. Section title was revised to include chute enclosures.		X			Clarification for better enforcement and application.
Section 714: Penetrations						
FS50-18	714.5.2 Modified: Exception 7 to membrane penetrations was clarified to be a maximum of 2-hour fire-resistance-rated horizontal assemblies.		X			Provides a clarification for better enforcement and application and clarifies additional code intent.
Section 715: Joints and Voids						

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
N/A	Modified: The section name was revised from "Fire-Resistant Joint Systems" to "Joints and Voids". This nomenclature is revised through the section. The section was reformatted and clarified with more consistence terminology. Multiple section numbers changed.		X			Clarification for better enforcement and application.
FS51-18	715.1 New: A new description for joint and void provisions is provided.		X			Provides a clarification for better enforcement and application.
FS52-18	715.2 Modified: Installation requires the system or materials not to dislodge or loosen. Voids protected at exterior curtain walls and fire-resistance-rated floor intersection must be installed with listing criteria.		X			Current requirements are incomplete. New requirements are provided to protect all joints, though code intent has not changed.
FS51-18	715.3 Modified: Name nomenclature revised to "Fire-resistance-rated assembly intersections" due to reorganization.		X			Reorganized original requirements.
FS53-18, FS54-18	715.4 Modified: Name nomenclature revised to clarify fire-resistance-rated floor intersections. Assemblies must be protected by approved perimeter fire containment systems and must provide an F rating. Fire-resistance-rated floor intersections include both floor and floor ceiling assemblies. Voids are protected in lieu of being sealed.		X			Clarification and coordination of language for better enforcement and application.
FS53-18	715.4.1 Modified: The fire test criteria exception for exterior curtain wall/fire-resistance-rated floor intersections was moved to this section with no technical change.		X			Clarification without code intent change.
FS51-18, FS52-18	715.5 Modified: Voids are intended to be protected with a rated assembly in lieu of being sealed.		X			Clarification without code intent change.
FS51-18, FS52-18, FS53-18	715.6 Modified: To clarify voids between exterior curtain wall assemblies and vertical fire barriers.		X			Clarification for better enforcement and application.
FS51-18, FS53-18, FS54-18	715.7 Modified: Section name revised to Curtain wall spandrels. All references to the previous name are revised. Referenced sections changed based on reorganization.		X			Clarification without code intent change.
Section 716: Opening Protectives						

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
FS26-18, FS56-18, FS59-18	Table 716.1(2) Modified: New double fire walls (NFPA 221) assembly type added to the opening protectives table. Multiple footnotes added and changed in the table to show new protection requirements for energy storage systems.			X	Cost already noted in Section 707	Design flexibility change and includes added requirements for energy storage system separations.
FS60-18	716.2.2.1.1 Modified: Terminated stops are prohibited on doors for smoke and draft controls.		X			Prohibits use of terminated stops on door frames for smoke and draft protection of elevator lobbies.
FS26-18	716.2.5.4.1 New: Fire-protection-rated glazing is not permitted in fire door assemblies to enclose energy storage systems.		X			Only fire-resistance-rated glazing assemblies are permitted.
FS26-18	716.3.2.1.1 New: Fire-protection-rated glazing is not permitted in fire window assemblies to enclose energy storage systems.		X			Only fire-resistance-rated glazing assemblies are permitted.
G34-18	716.4 New: Fire protective curtain assemblies are a permitted opening protective.	X				Design flexibility change.
Section 717: Ducts and Air Transfer Openings						
FS62-18	717.2 Modified: Referenced sections for damper installation editorially clarified.		X			Clarification without code intent change.
FS62-18	717.2.3 New: Dampers used in static systems shall only be used in HVAC systems that shut down during a fire.		X			Clarification for better enforcement and application.
FS62-18, FS64-18	717.3.1 Modified: References to dampers used in dynamic systems removed to be provided later in the section.		X			Clarification to coordinate with other code updates.
FS65-18	717.3.3.1 Modified: Section name was revised to remove device. Fire damper actuation nomenclature revised.		X			Clarification without code intent change.
FS66-18	717.4 Modified: This section was completely revised to provide clarity and add substance by pointing to IFC and NFPA requirements for testing.		X			Clarification and more restrictive requirements.
FS67-18	717.5.2 Modified: Nonmetal flexible air connectors are permitted at certain locations for Exception 3 of Fire barriers. Clarified duct systems must be fully ducted systems.	X			$100 per fire damper	Clarification that some situations with flex ducts are permitted to omit fire dampers.
FS70-18	717.5.3 Modified: Provides a minimum steel wall thickness of the duct and requires an exhaust fan at the top of the shaft to meet		X		Cost between the damper and through penetration	Clarification and correlation. It could increase the cost by the new requirements.

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CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	exception 1.1. Nomenclature for minimum and outside revised.				protection is similar	
FS70-18	717.5.3.1 New: Ducts providing continuous upward airflow to a shaft shall not have a damper.		X		Cost between damper and through penetration protection is similar	Clarification for better enforcement and application. Dampers can be omitted in these scenarios now.
FS64-18	717.6.2.1.1 New: Dynamic system dampers are designed with fans on during a fire.			X	$200/ Damper	Clarification for better enforcement and application. Adding fans to coordinate dynamic dampers design with.
FS64-18	717.6.2.1.2 New: Static system dampers are provided with systems which are not designed to operate during a fire.	X			$200/ Damper	Clarification for better enforcement and application. By providing options for static dampers, cost impact may be reduced.
Section 718: Concealed Spaces						
FS72-18, FS73-18	718.2.1 Modified: Fireblocking materials includes a revised description for cellulose insulation and also includes mass timber.		X			Design flexibility change to accommodate the new mass timber options and clarifying the cellulose testing requirements.
Section 721: Prescriptive Fire Resistance						
FS76-18	721.1(3) Modified: Item number 5-2.1 requires 5/8” Type X gypsum wallboard in lieu of 3/8”.		X			Correction of a previous typo as 3/8” Type X gypsum are not readily available.
Section 722: Calculated Fire Resistance						
FS77-18	722.1 Modified: This section is reorganized for general calculated fire resistance. Substance change allows concrete assemblies to have calculated fire resistance in accordance with PCI 124.		X			Clarification for better enforcement and application.
FS79-18	722.2.2.1.4 New: Flat plate concrete slabs with uniformly spaced hollow voids is an option for rated concrete floor and roof slabs.		X			Design flexibility change.
FS77-18	722.2.3.1 Modified: For precast prestressed concrete slab covers, the procedures now reference PCI 124.		X			Clarification for better enforcement and application.

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CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
N/A	Figure 722.5.1(2) Modified: Figure notes moved with no substance change.		X			Clarification without code intent change.
N/A	Figure 722.5.1(3) Modified: Figure notes moved with no substance change.		X			Clarification without code intent change.
N/A	722.6.2.4 Modified: Referenced section revised based on the reorganization of Section 703.		X			Clarification without code intent change.
FS81-18	722.7 New: This section provides fire-resistance ratings for mass timber.		X			Necessary revision based on mass timber reviews and testing to create new mass timber construction types.
Chapter 8: Interior Finishes						
Section 803: Wall and Ceiling Finishes						
FS84-18	803.10 Modified: Site fabricated stretch systems must comply with requirements of Class A in accordance with Section 803.1.2			X	Cost will need to be determined by manufacturers to meet new Class A requirements	Clarification, but if previously misinterpreted, cost could be increased. Provides more restrictive requirements for site-fabricated stretch systems.
Section 806: Decorative Materials and Trim						
FS86-18	806.9 New: Combustible lockers must be considered an interior finish and comply with Section 803.		X			Coordinated combustible locker requirements with IFC requirements. No technical changes.
Chapter 9: Fire Protection and Life Safety Systems						
Section 901: General						
F97-18	901.1 Modified: Scope is clarified to include life safety systems.		X			Clarification for better enforcement and application.
F97-18	901.2 Modified: Fire protection systems is clarified to include life safety systems.		X			Clarification for better enforcement and application.
Section 903: Automatic Sprinkler Systems						
F102-18	903.2.4 Modified: The display and sale of upholstered furniture is moved to a later section for Group F-1 sprinkler system requirements.		X			Clarification for better enforcement and application.
F276-18	903.2.4.2 New: Manufacturing distilled spirits requires a sprinkler system.			X	$50,000 per new incoming water & $2 per sqft	Imposes new sprinkler requirement

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
F102-18	903.2.4.3 New: A sprinkler system is required if the Group F-1 fire area is used for display and sale of upholstered furniture or mattress that exceeds 2,500 square feet.			X	$50,000 per new incoming water & $2 per sqft	Clarification for better enforcement and application.
F102-18	903.2.7 Modified: The display and sale of upholstered furniture is moved to a later section for Group M sprinkler system requirements.		X			Clarification for better enforcement and application.
F102-18	903.2.7.2 New: A sprinkler system is required if the Group M fire area is used for display and sale of upholstered furniture or mattress that exceeds 5,000 square feet.		X			Clarification for better enforcement and application.
F102-18	903.2.9 Modified: The display and sale of upholstered furniture is moved to a later section for Group S-1 sprinkler system requirements.		X			Clarification for better enforcement and application.
F276-18	903.2.9.3 New: Storage distilled spirits or wine requires a sprinkler system.			X	$50,000 per new incoming water & $2 per sqft	Imposes a new sprinkler requirement.
F276-18	903.2.9.4 New: A sprinkler system is required if the Group S-1 fire area is used for display and sale of upholstered furniture or mattress that exceeds 2,500 square feet. Exception is self-service storage of one story with all storage spaces accessed by the exterior.		X			Clarification for better enforcement and application.
F110-18	903.2.10 Modified: Sprinkler systems must also be installed in open parking garages for fire areas exceeding 48,000 square feet.			X	Cost already noted in Ch 4 cost estimates	Greater hazards of vehicles require open parking garages to need sprinkler systems.
G39-18	903.2.10.2 New: Sprinkler systems are required in mechanical-access enclosed parking garages.			X	$50,000 per new incoming water and 2 per sqft	Imposes a new sprinkler requirement.
F110-18	903.2.11.3 Modified: Open parking garages are removed from being exempt from sprinkler systems.			X	Cost already noted in Ch 4 cost estimates	Open parking garages over 48,000 square feet will require a sprinkler system.
F112-18	903.2.11.6 Modified: Section title replaces suppression nomenclature with fire protection. Suppression nomenclature is replaced with protection.		X			Clarification without code intent change.

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CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
F112-18	Table 903.2.11.6 Modified: Section title replaces suppression nomenclature with protection.		X			Clarification without code intent change.
F117-18	903.3.1.2 Modified: The allowance for NFPA 13R systems to be permitted to be used has changed to be based on height above or below the lowest level of fire department access.			X	$20,000 per increased incoming water and $0.50 per sqft if a NFPA 13 system is needed	Type 13R sprinkler systems will be permitted in significantly less buildings. Many buildings that would previously have permitted them, will now be required to have NFPA 13.
F119-18	903.3.1.2.2 Modified: Multiple conditions with corridors and balconies in the means of egress require sprinklers.			X	$300 per dry sprinkler	Additional sprinklers required in more conditions in the means of egress in NFPA 13R system buildings.
F120-18	903.3.1.2.3 Modified: Provides a clarification where the lowest level of fire department access needed to meet the provisions in Section 503.		X			Clarification for better enforcement and application. Only affects jurisdictions not currently enforcing IFC requirements.
F123-18	903.4 Modified: Clarifies that underground key or hub gate valves in roadway boxes do not need supervision.		X			Clarification for better enforcement and application.
F123-18	903.4.1 Modified: Exception moved to Section 903.4		X			Provides a necessary clarification.
Section 904: Alternative Automatic Fire-Extinguishing Systems						
F124-18, F124-18, G40-18, G55-18, F124-18	Modified: This section has reorganized Sections 904.12 through 904.14.		X			Clarification without code intent change.
F124-18	904.12 Modified: Aerosol fire-extinguishing systems are in accordance with NFPA 2010. Clarifications were provided to the description.		X			Change is consistent with NFPA 2010.
F124-18, G40-18	904.14 Modified: The section title nomenclature has been revised from systems to facilities.		X			Clarification for better enforcement and application.
Section 905: Standpipe Systems						
171 F126-18	905.3.1 Modified: Class I standpipes are allowed in all parking garages.	X			$350 per omitted	Clarification for better enforcement and application.

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
					occupant hose and outlet	
FS153-18	905.3.8 Modified: This section no longer refers to rooftop gardens as it is not defined in Chapter 2. More consistent terminology used.		X			Clarification for better enforcement and application.
F128-18	905.9 Modified: Clarifies all underground key or hub gate valves in roadway boxes do not need supervision and valves for dry manual standpipes are permitted to be locked in the open position.	x			$500 per tamper switch	Clarification for better enforcement and application to provide consistency in market and eliminate interpretations of code.
F125-18	905.11 Modified: The fire code official can require locking caps on all standpipe outlets, instead of only dry standpipes.			X	Cap approx. $250 each	Provides the fire code official with more options.
Section 907: Standpipe Systems						
N/A	907.2 Modified: New requirements for Group S manual fire alarm systems were provided, changing the section numbers for Section 907.2.10 through Section 907.2.23.		X			Clarification without code intent change.
F136-18	907.2.2 Modified: Group B manual fire alarm system must activate occupant notification system.		X			Provides a necessary clarification.
F139-18	907.2.3 Modified: Editorial changes are provided for Exception 1 and 3. Manual fire alarm boxes are not required in Group E occupancies where manual activation is provided from a normally occupied location in addition to the other existing requirements.		X			Provides additional requirements to coordinate with how schools are typically designed.
F141-18	907.2.10 New: Manual fire alarm systems are required in Group S public and self-storage occupancies that are more than three stories in height, except when automatic sprinkler protection is provided.			X	$1 per sq ft assuming basic fire alarm system	Imposes new manual fire alarm requirement.
F45-18, F141-18	907.2.13.2 Modified: Provides a clarification where emergency responder radio systems are in-building two-way emergency responder communication systems.		X			Clarification for better enforcement and application.
F203-18	907.2.23 Modified: Battery room requirements have been re-labeled as Energy storage system requirements.		X			Clarification for better enforcement and application.
F144-18	907.4 Modified: This section is rewritten and reorganized with Section 907.5 without code intent change.		X			Clarification without code intent change.

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CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
F146-18	907.4.2.4 Modified: Provides a clarification that signs are required where not monitored by an approved supervising station accordance with Section 907.6.6.		X			Clarification for better enforcement and application.
F144-18	907.5 Modified: This section is rewritten and reorganized with Section 907.4 without code intent change, excluding one substantive change see below notes.		X			New requirements for Group R-1 and R-2 occupant notification.
F144-18	907.5.1 New: Alarm activation and annunciation has been moved to this section. Annunciation shall also be activated where allowed by Section 907, at a constantly attended location.		X			Provides a clarification for better enforcement and application.
F144-18	907.5.1.1 New: Presignal feature has been moved to this section.		X			Provides an Clarification without code intent change.
F148-18	907.5.2.1.2 Modified: Maximum sound pressure has been adjusted to total sound pressure level by combining ambient sound pressure level with audible notification appliances shall not exceed 110 dBA. Audible alarm notification appliances are not required at 105 dBA average ambient noise.		X			Updated requirements to match NFPA 72 requirements. Changes 110 dBA to combination of ambient and alarm sound. Increases requirement to remove audible notification from 95 dBA to 105dBA
F144-18	907.5.2.1.3 New: This section addresses audible signal frequency in Group R-1 and R-2 occupancies.			X	$57 per sleeping room no voice evac system $107 per sleeping room with voice evac system	Provides additional requirements for Group R-1 and R-2 sleeping rooms.
F149-18	907.5.2.2.5 Modified: Emergency voice/alarm communication systems shall be provided with standby power per NFPA 72 requirements.	X				This clarifies requirement and alignment with NFPA 72.
F152-18	907.5.2.3.3 Modified: Group R-2 occupancies are clarified to support future visible alarm notification appliances in accordance with Chapter 11 of ICC A117.1. The future capability options were moved to a later section.		X			Provides an Clarification without code intent change.

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CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
F152-18	907.5.2.3.3.1 New: The future capacity (min. 5%) for visible alarm notification appliances were moved to this section and required to be wired equipment. The capability options were modified.		X			More clearly quantified existing requirement. Depending on the contractor this may be more or less excess than they previously provided.
F112-18	907.6.4.2 Modified: For high rise building zoning, all fire protection systems must be zoned per floor.		X			Clarification for better enforcement and application of the code requirements.
F154-18	907.6.6.1 Modified: Section was completely rewritten to provide transmission of alarm signals to supervising station in accordance with NFPA 72.		X			Change provides consistency with NFPA 72
F155-18	907.6.6.2 New: Transmission of alarm signal with monitor it yourself to a public safety answering point is not permitted unless allowed by the fire code official. The following section numbers were revised accordingly.		X			Provides consistency with NFPA 72. Requires fire code official approval for monitor it yourself transmission.
Section 908: Emergency Alarm Systems						
F159-18	908.3 New: Emergency alarm system signals that interface with the Fire Alarm Control Unit shall be supervisory signals.		X			Provides requirement for other emergency alarm systems interfacing with the FACP and only affects internal programming.
Section 909: Smoke Control Systems						
F161-18	909.17 Modified: All components that operate a smoke control system must achieve final operating state within 90 seconds of FACP detection signal.		X			Provides enforceable requirement for smoke control components activating, but it is anticipated that all components of smoke control system can easily configure and meet these requirements.
FS90-18	909.20 Modified: Smokeproof enclosures include pressurized stairs or pressurized entrance vestibules as an alternative.	X			$100,000 or more depending on configuration	Provides a clarification for better enforcement and application.
FS90-18	909.20.6 New: New requirements for smokeproof enclosures using a pressurized stair and pressurized entrance vestibule.		X			Use of pressurized vestibule and stairwell helps to meet minimum pressurization

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
						requirements without additional ducts/ fans.
FS90-18	909.20.7 Modified: As 906.20.6 is new, this section number was revised accordingly, and Section 906.20.6 is also referenced for ventilating equipment.		X			Provides a clarification for better enforcement and application.
Section 910: Smoke and Heat Removal						
F165-18	910.3.4 New: New requirements for vent operation are provided for smoke and heat vents to be operated by automatic and manual means.		X			Code intent remains the same and is coordinated with NFPA 2014 installation requirements.
F166-18	910.3.5 New: New requirements for fusible link temperature rating are provided for smoke and heat vents at 360 degrees per FM guidance and tests.			X	Minimal cost impact will most likely affect manufacturers as they adjust to meet this minimum	Smoke and heat vents are required to have temperature rating of 360° F when installed in sprinklered area and operate by fusible link, but typically they were between 350° and 400°F.
Section 911: Fire Command Center						
F42-18	911.1 New: Fire Command Center is now required at all F-1 and S-1 buildings more than 500,000 square feet.			X	Approx. 0.06% construction cost of 500,000 sqft building	Types of buildings can be just as difficult for firefighting as high-rises. Provides a safe location for fire fighters with all equipment needed to manage the building.
F42-18	911.1.1 Modified: Nomenclature for accessibility of was revised for location and access to the fire command center.		X			Clarification without code intent change.
F42-18	911.1.3 Modified: Where the fire command center is required, it must be a minimum 96 square feet and 8 feet in both directions			X	Cost already noted in Section 911.1	Provides a minimum size for the fire command center
F42-18	911.1.7 New: New requirements for fire command center identification is provided.			X	$50 per sign may vary depending on buildings aesthetic needs	Identification by an easily visible sign reading “FIRE COMMAND CENTER” located on the door is required.
Section 913: Fire Pumps						
F172-18	913.1 Modified: Fire pump for fire protection system shall be installed with this section and		X			Clarifies original code intent and coordinates

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	NFPA 20 except pump for NFPA 13D sprinkler systems, or Section P2904 of the IRC.					with NFPA 13D requirements.
F174-18	913.2.2 Modified: Cables supplying fire pumps may be protected using cable or raceways incased in a minimum of 2 inches of concrete except where a fire pump room or generator room is separated by fire-resistance-rated construction.		X			This clarifies an option already permitted per NEC to protect the fire pump circuits.
Section 918: Emergency Responder Communication Coverage						
F45-18	Modified: The section name was revised from "Emergency Responder Radio Coverage" to "Emergency Responder Communication Coverage." This nomenclature is revised through the section.		X			This change is consistent with Section 510 of the IFC.
F45-18	918.1 Modified: Provides a clarification where emergency responder radio systems are in-building two-way emergency responder communication systems.		X			This change is consistent with Section 510 of the IFC. Requirements are the same and editorial in nature.
Chapter 10: Means of Egress						
Section 1003: General Means of Egress						
E4-18, E37-18	1003.5 Modified: Exception 1 to Elevation change was completely revised to steps at exterior doors complying with Section 1010.1.4.		X			Coordinated code sections within IBC and points to new exterior door requirements
Section 1006: Number of Exits and Exit Access Doorways						
E11-18	1006.2.1 Modified: Unoccupied mechanical rooms and penthouses are not required to comply with common path measurements.	X			$5,000 per ATD and roof hatch, more for full stair extension	Clarifies intent that unoccupied roofs must only meet travel distance to an exit requirement. Additional exits no longer required for these areas to meet common path of travel.
E13-18	1006.2.2 Modified: Egress based on use is clarified to include the numbers, configurations, and types of components of exits or access to exits.		X			Clarification for better enforcement and application.
E15-18 PART I	1006.2.2.2 Modified: Exits and exit access doorways shall be equipped with panic hardware for refrigeration machinery rooms.			X	$1,250 per door	Provides additional protection to occupants due to risk of rapid release of hazardous or asphyxiant gases.

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
E17-18, E37-18	1006.2.2.4 New: Old text deleted and replaced with electrical room requirements. Directs to specific sections of NFPA 70 and required panic hardware per 1010.1.10.1.		X			This additional code clarifies existing NFPA 70 requirements.
E18-18	1006.3 Deleted: Stairways serving more than one story was relocated to a later section.		X			Clarifies existing code intent to streamline design and permit process.
E18-18	1006.3.1 New: The occupant load from stairways serving more than one story was relocated to this section. The following section numbers were revised accordingly.		X			Clarifies existing code intent to streamline design and permit process.
E18-18	1006.3.2 New: Section name nomenclature revised to path of egress travel. New exceptions are provided for exit access stairways and ramps within an atrium and exterior exit access stairways and ramps between occupied roofs. Clarifies that a stair in atrium that is not part of the means of egress is always acceptable and not limited to the one adjacent story criteria. And an exit access stair from occupiable roof is permitted to pass through more than one adjacent story.		X			Clarifies existing code intent to streamline design and permit process.
E18-18, E24-18	1006.3.4 Modified: Common path of egress nomenclature was revised to exit access.		X			Provides consistency throughout code for use of common path of travel and exit access travel distance.
E18-18, E24-18	Table 1006.3.4(1) Modified: Common path of egress nomenclature was revised to exit access.		X			Provides consistency throughout code for use of common path of travel and exit access travel distance.
E18-18, E24-18	Table 1006.3.4(2) Modified: Common path of egress nomenclature was revised to exit access.		X			Provides consistency throughout code for use of common path of travel and exit access travel distance.
Section 1008: Means of Egress Illumination						
	1008.2.1 New: Along exit access stairways and exit stairways, illumination level shall be 10 foot-candles when the stairway is in use.		X			Clarification for minimum lighting required under normal power already required by NFPA 1 and

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
						101. This level is not anticipated at all times the building is occupied.
E28-18	1008.3.1 Modified: Means of egress nomenclature was revised to exit or access to exits.		X			Clarification without code intent change.
E28-18, E37-18	1008.3.2 Modified: Means of egress nomenclature was revised to exit or access to exits.		X			Clarification without code intent change.
Section 1009: Accessible Means of Egress						
E30-18	1009.2.1 Modified: Elevators are required where an occupied roof is four or more stories above a level of exit discharge.		X			Clarification of original code intent for occupied roofs to be provided accessible elevators if above 3rd story of a building. Depending on original local code interpretation, this is no project cost or added cost
E33-18	1009.6.2 Modified: An interior area of refuge is permitted on the level of exit discharge with direct access to an exterior exit door.		X			This clarifies design intent for interior areas of refuge being permitted in lieu of an exterior area of rescue assistance. Code intent has not changed.
E34-18	1009.6.3 Modified: Area of refuge size is increased to be 52 inches rather than 48 inches, for each 200 occupants or portion thereof.			X	Additional space taken from usable areas of the building, but no direct added cost associated with building a larger area of refuge.	Size of area of refuge was increased from 30”x48” to 30”x52” to be consistent with 2017 ICC A117.1.
E36-18	1009.8.1 Modified: The two -way communication must be to an approved supervising station.		X			Clarification for better enforcement and application as “approved supervising station” is defined in chapter 2.
Section 1010: Doors, Gates, and Turnstiles						

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CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
E37-18	Modified: This section was nearly completely reorganized. Very few section numbers remained the same.		X			Provided to group like items together, no technical changes unless otherwise noted.
E38-18	Modified: The sections are adjusted to provide proper legal charging language for sections that were lacking including: 1020.1, 1024.1, 1026.1, 1027.1, 1028.1, 1029, 1029.1, 1029.2, 1029.3.		X			No technical changes provided, language updated for consistency and to help with legal adoption of IBC codes locally and is editorial in nature.
E37-18	1010.1 Modified: Section title nomenclature revised to General. This section was almost completely revised to add clarity and substance.		X			Clarification for better enforcement and application.
E37-18, E39-18, E40-18	1010.1.1 Modified: The maximum width of a swinging door leaf is not limited. Additionally, the minimum clear opening width to non-accessible single-user shower or sauna compartments, toilet stalls or dressing, fitting, or changing rooms is 20 inches.	X			$25 per smaller door used	Maximum size of doors is already accommodated by other door requirements (force, etc.) but there will be a decrease due to the reduced minimum clear openings to 20 inches.
E41-18	1010.1.1.1 Modified: Section name nomenclature revised to be opening in lieu of width. Overhead door stops, power door operators, and electromagnetic door locks are permitted to project into the clear opening.		X			Provides common use terminology for door hardware and clarifies allowances for other types of typically installed doors. This is already a typical practice.
232 E37-18, E42-18	1010.1.2 Modified: Section nomenclature revised to be egress door types. Side-hinged swing door, pivoted door, or balanced door types are applicable.		X			Balanced doors are clarified as acceptable egress door, which is consistent with the intent of the original provisions.
E42-18	1010.1.2.1 Modified: Side-hinged swing door, pivoted door, or balanced door types as applicable shall swing in the direction of egress travel.		X			Balanced doors are clarified as acceptable egress door, which is consistent with the intent of the original provisions.
E44-18	1010.1.3 Modified: This section was completely rewritten. Door opening force was removed and replaced with Forced to unlatch		X			Updates and clarified door force and unlatching requirements to coordinate with

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	and open doors. Revised requirements are provided for required forces.					accessibility and 2017 ICC A117.1 requirements.
E44-18	1010.1.3.2 New: New requirements are provided for manual horizontal sliding doors.			X		Latch for manual horizontal sliding door to prevent the door from rebounding open when closed and coordinates with CMS requirements for when these types of doors are provided and required to latch.
E4-18	1010.1.5 Modified: Additional language provided regarding step down permitted at exterior doors in Group F, H, R-2, and S occupancies not part of an accessible route where the occupant load is low and trip hazard unlikely.			X		Language coincides with the previous 2018 commentary removing the exception previously associated with Group R-3 and U occupancies.
E15-18 Part I	1010.1.10 Modified: Additional language added to coordinate with new requirements for panic hardware serving refrigeration machinery rooms.		X			No impact and added language in a separate section and this language is just coordination.
E37-18, E54-18	1010.2.1 Modified: The unlatching for egress doors shall require not more than one motion in a single linear or rotational direction to release all latching and locking devices.		X		Cost associated with this requirement is included in other section	Clarification to reduce ambiguity during the design, construction and code inspection process and introduces the BHMA A156.41 requirements, which mostly affect manufacturers but may trickle down to consumers.
E37-18, E52-18	1010.2.4 Modified: Locks and latches are permitted where occupants must egress from an exterior space through the building (other than egress courts), doors at balconies, decks or other exterior spaces serving individual dwelling or sleeping units, or sleeping units, private office spaces, or Group I-1, Condition 2 and Group I-2 occupancies where persons pose a security threat.		X			Design flexibility change.
E37-18, E48-18	1010.2.8 Modified: Locking arrangements in educational occupancies and Group I-4 occupancies must comply with modifications		X			Change correlates recent changes to other NFPA and ICC codes associated

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	to fire door assemblies in accordance with NFPA 80, in addition to the other existing requirements. Remote locking or unlocking of doors from an approved location shall be permitted. Clarifications provided.					with Educational Occupancy locking arrangements. No technical changes are provided.
E37-18, E53-18	1010.2.9 Modified: Exit access doors serving occupied exterior areas and courtrooms are permitted to be locked.			X	Increases initial construction costs, but long term less expensive to avoid violations.	Locks are often provided in these locations, so this new requirement provides a safe, reasonable, and consistent approach for the safety of people occupying outdoor areas who must re-enter the building for egress.
E15-18 PART 1	1010.2.9.1 New: Panic hardware or fire exit hardware is required in refrigeration machinery rooms.			X	Cost associated with this requirement is included in other section	Additional protection to occupants due to risk of rapid release of hazardous or asphyxiant gases.
E64-18	1010.2.9.2 New: Panic hardware or fire exit hardware and door swing are clarified based on electrical equipment.		X			Aligns code requirements in IBC with NFPA 70 requirements, which were already required per Chapter 27 of the IBC.
E37-18, E61-18	1010.2.12 Modified: Emergency lighting is required on the egress side of the door for electrically locked egress doors with sensor release.			X	$300 per self-contained battery-operated light	Additional requirements to ensure occupants are provided with minimum egress illumination for door operation and reading the sign.
E37-18, E58-18	1010.2.13 Modified: Delayed egress is permitted for courtrooms in Group A-3 and B occupancies.		X			Clarification of the current code intent with no change to technical criteria.
E37-18, E46-18	1010.3.1 Modified: Emergency stop switches are required to be provided between 34 inches and 48 inches above the floor.		X			Emergency stop switch height AFF revised to be between 34” and 48” from 24” and 48” to make requirement consistent with latest addition of ANSI/BHMA A156.27.

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CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
E37-18, E47-18	1010.3.3 Modified: An Clarification was provided for Criteria 2 noting that the door is only required to be openable from the egress side.		X			Clarification for original design intent and design alternative to meet security needs of particular building.
E28-18, E37-18	1010.3.4 Modified: Means of egress nomenclature was revised to exit or access to exits.		X			Clarification without code intent change.
F14-18 PART 1	1010.5.2 Modified: Security access turnstiles may be utilized in buildings with an approved, supervised automatic sprinkler system.		X			Clarification without code intent change.
Section 1011: Stairways						
E66-18	1011.5.2 Modified: Stair riser heights are required to be measured between the stairway landing and the adjacent tread.		X			Clarification for better enforcement and application.
E68-18, E69-18, E70-18	1011.6 Modified: A door shall not project more than 7 inches into the required width of a landing. An exception to the measurement of stairway landings is provided for intermediate landings of curved stairway. An exception is provided for the minimum landing depth for stairway landings where a landing turns 90 degrees or more.		X X X			Clarifies original intent of projections into the required width. Clarification for how to measure landings and design of curved stairways. Clarification of stair landing design intent, which has previously been in commentary noting that landings need not be rectangular.
G95-18	1011.7 Modified: Interior exit stairways may be combustible in podium style buildings in accordance with Section 510.2. Section was reorganized.	X				Provides allowance for combustible construction to be continued below podium as long as the rating is 3 hours in podium eliminating need for transition from wood to steel.
E71-18	1011.11 Modified: One or two steps necessary to get to a stationary platform lift do not need handrails provided they meet certain criteria.	X				Design flexibility change, for very specific use platform lifts typically used in court rooms.
Section 1013: Exit Signs						
E72-8, E73-18	1013.4 Modified: Where exit signs are provided at a horizontal exit or any other			X	$50 per sign based on	Clarification of original design intent for these

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	existing condition, they must have raised characters and braille exit signs.				aesthetic needs of building	signs and clarifies that horizontal exits are considered exits. No technical changes provided.
Section 1015: Guards						
E77-18	1015.2 Modified: Guards are not required on the loading side of the station platforms on fixed guideways transit or passenger rail systems.		X			Adds exception that is commonly recognized and designed per NFPA 130.
E86-18	1015.7 Modified: The guard shall extend 30 inches beyond each end of roof access hatch parallel to the roof edge when within 10 ft of the roof edge.			X	$250 per 7 ft section	Provides additional location where the guard is required for true life safety.
E80-18	1015.8 Modified: The bottom of the clear opening of an operable window is the point of measurement when child fall protection is required.		X			Clarification of how to measure height, but general design requirements are still the same.
Section 1016: Exit Access						
E85-18	1016.2 Modified: Where access to two or more exits or exit access doorways is required, one required exit cannot travel through an enclosed elevator lobby. If a tenant space only requires a single exit access path, it is permitted to go through the elevator lobby.		X			Clarification of code intent, general requirements are still the same.
Section 1017: Exit Access Travel Distance						
E86-18	1017.3 Modified: Where more than one exit is required, exit access travel distance shall be measured to the nearest exit.		X			Clarification of code intent, general requirements are still the same.
G31-18	1017.3.2 New: Provides exit access travel distance requirements for atriums and cannot be greater than 200 feet.		X			Relocates atrium egress requirements to Ch 10, no major technical changes.
Section 1019: Exit Access Stairways and Ramps						
E18-18, E88-18, E89-18	1019.3 Modified: Exit access stairways and ramps that only communicate between two adjacent stories do not require a shaft enclosure. Exterior exit access stairways or ramps between occupied roofs do not require a shaft enclosure. Clarifications were provided.	X			$25,000 per stair or $100,000 per ramp	Clarification for better enforcement and application.
Section 1020: Corridors						

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CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
E38-18, FS18-18	1020.1 New: A new description for corridors is provided with no technical change. The following section numbers were revised accordingly.		X			Clarification for better enforcement and application.
E38-18, E91-18	1020.5 Modified: Group I-2, Condition 2 dead end corridors cannot exceed 30 feet if it is not serving patient rooms or patient treatment rooms		X			More flexible dead-end requirements when outside of patient care areas to become more consistent with *NFPA 101* as adopted by CMS
Section 1023: Interior Exit Stairways and Ramps						
E94-18, G95-18	1023.2 Modified: Provides clarification that fire-resistance-rated construction applies to enclosures of interior exit stairways. Interior exit stairways for podium buildings in accordance with Section 510.2 is provided as a new exception.		X			Clarification for better enforcement and application.
E98-18	1023.5 Modified: Structural elements supporting the interior exit stairway, or ramp, or enclosure can penetrate into the interior exit stairway or ramp enclosure.		X			Clarification for better enforcement and application.
N/A	1023.8 Modified: Section title nomenclature revised to barrier at level of exit discharge.		X			Clarification without code intent change.
E72-18	1023.9 Modified: The bottom of the stairway identification sign is required to be at least 5 feet above the floor landing and readily visible with open or closed doors. Floor level stairway identification signs were relocated to a later section.		X			Code clarification and reorganization but signs are already required by code.
E72-18	1023.11 New: Where provided floor level signs are required to be tactile floor-level signs with braille.		X			Code clarification and reorganization but signs are already required by code.
Section 1024: Exit Passageways						
E38-18	1024.1 Modified: Section title nomenclature revised to general.		X			Clarification without code intent change.
E101-18	1024.6 Modified: Equipment and ductwork necessary for independent ventilation can penetrate into or through and exit passageway.		X			Clarification for better enforcement and applicatio and coordination with exit enclosure requirements.
E102-18	1024.8 New: New requirements are provided for exit passageway exterior walls to be consistent with stair exposure criteria.			X	$0.35 per sqft of gypsum separation	Clarifies that exterior walls of exit passageway need to meet the same

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CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
					wall needing 1-hour upgrade for exposure risk	requirements as a stair enclosure.
Section 1026: Horizontal Exits						
E38-18	1026.1 Modified: Section title nomenclature revised to General.		X			Provides an Clarification without code intent change.
Section 1027: Exterior Exit Stairways and Ramps						
E38-38	1027.1 Modified: Section title nomenclature revised to General. Description for exterior exit stairways and ramps was clarified.		X			Provides clarification for better enforcement and application.
Section 1028: Exit Discharge						
E38-18	1028.1 New: A new description for exit discharge is provided with multiple section numbers revised accordingly.		X			Provides clarification for better enforcement and application.
E38-18, G31-18	1028.2 Modified: Atriums are included as an area for Exception 1 for interior exit discharge.		X			Provides clarification for better enforcement and application.
Section 1029: Egress Courts						
E38-18	New: This section completely revised, previously was 1028.4, for clarity and substance.		X			Provides clarification for better enforcement and application.
Section 1030: Assembly						
E38-18	Modified: This section number was revised based on the addition of Section 1029.		X			Clarification without code intent change.
E38-18, E106-18	1030.16 Modified: Provides additional requirements for stepped aisles that require two handrails with seating on one side.			X	$20/ft per extra handrail	Anticipated to assist with design of social stairs which are becoming more popular.
E38-18	1030.16.1 Modified: Section name nomenclature revised to include mid-aisle. Where two handrails are required for a stepped aisle, the mid handrail is discontinuous.			X	Cost associated with this requirement is included in other section.	Provides better language for the stepped aisles that require two handrails due to the changes of the previous section.
Section 1031: Emergency Escape and Rescue:						
E38-18	Modified: This section number was revised based on the addition of Section 1029.		X			Clarification without code intent change.
E107-18	1031.1 New: A new description for emergency escape and rescue is provided. The following section numbers were revised accordingly.		X			Clarification for better enforcement and application and

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
						coordination of IRC and IBC requirements.
282 E38-18, E107-18	1031.2 Modified: Storm shelters are not required to comply with for emergency escape and rescue requirements. Clarifications were provided.		X			Clarification for better enforcement and application and coordination of IRC and IBC requirements.
E107-18	1031.3 New: New requirements are provided for emergency escape and rescue openings.		X			Clarification for better enforcement and application and coordination of IRC and IBC requirements.
E110-18	1031.4 New: New requirements are provided for emergency escape and rescue doors to be swinging or sliding door.		X			Clarification for better enforcement and application and coordination of IRC and IBC requirements.
E38-18, E107-18	1031.5 Modified: Section name nomenclature was revised to area wells from window wells. The section was nearly completely rewritten to add clarity and substance.		X			Clarification for better enforcement and application and coordination of IRC and IBC requirements.
E38-18, E107-18, E110-18, E111-18	1031.6 Modified: Most changes are editorial in nature for clarification. A substantive change includes the reference to existing buildings is removed.			X	$100/ft of length per ladder installation	Coordination of IRC and IBC requirements and addition of stair/ ladder requirements.
E27-18	**1008.2.1 Illumination level under normal power.** The means of egress illumination level shall be not less than 1 footcandle (11 lux) at the walking surface. <u>Along exit access stairways, exit stairways and at their required landings, the illumination level shall not be less than 10 footcandles at the walking surface when the stairway is in use.</u> **Exception:** For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances by one of the following methods provided that the required illumination is automatically restored upon activation of a premises' fire alarm system: 1. Externally illuminated walking surfaces shall be permitted to be illuminated to not less than 0.2 footcandle (2.15 lux).			X	$1.00 per room sqft.	Clarification

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	2. Steps, landings and the sides of ramps shall be permitted to be marked with self-luminous materials in accordance with Sections 1025.2.1, 1025.2.2 and 1025.2.4 by systems listed in accordance with UL 1994. **1008.2.1 Illumination level under normal power.** The means of egress illumination level shall be not less than 1 footcandle (11 lux) at the walking surface. Along exit access stairways, exit stairways and at their required landings, the illumination level shall not be less than 10 footcandles at the walking surface when the stairway is in use. **Exception:** For auditoriums, theaters, concert or opera halls and similar assembly occupancies, the illumination at the walking surface is permitted to be reduced during performances by one of the following methods provided that the required illumination is automatically restored upon activation of a premises' fire alarm system: 1. Externally illuminated walking surfaces shall be permitted to be illuminated to not less than 0.2 footcandle (2.15 lux). 2. Steps, landings and the sides of ramps shall be permitted to be marked with self-luminous materials in accordance with Sections 1025.2.1, 1025.2.2 and 1025.2.4 by systems listed in accordance with UL 1994.					
E55-18	**1010.1.9.7 Controlled egress doors in Groups I-1 and I-2.** Electric locking systems, including electro-mechanical locking systems and electromagnetic locking systems, shall be permitted to be locked in the means of egress in Group I-1 or I-2 occupancies where the clinical needs of persons receiving care require their containment. Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke ~~or heat~~ detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following: 1. The door locks shall unlock on actuation of the automatic sprinkler system or automatic ~~fire~~ smoke detection system. 2. The door locks shall unlock on loss of power controlling the lock or lock mechanism.		X			Clarification

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	3. The door locking system shall be installed to have the capability of being unlocked by a switch located at the fire command center, a nursing station or other approved location. The switch shall directly break power to the lock. 4. A building occupant shall not be required to pass through more than one door equipped with a controlled egress locking system before entering an exit. 5. The procedures for unlocking the doors shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code. 6. All clinical staff shall have the keys, codes or other means necessary to operate the locking systems. 7. Emergency lighting shall be provided at the door. 8. The door locking system units shall be listed in accordance with UL 294. **Exceptions:** 1. Items 1 through 4 shall not apply to doors to areas occupied by persons who, because of clinical needs, require restraint or containment as part of the function of a psychiatric treatment area. 2. Items 1 through 4 shall not apply to doors to areas where a listed egress control system is utilized to reduce the risk of child abduction from nursery and obstetric areas of a Group I-2 hospital.					

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
E57-18	**1010.1.9.7 Controlled egress doors in Groups I-1 and I-2.** Electric locking systems, including electro-mechanical locking systems and electromagnetic locking systems, shall be permitted to be locked in the means of egress in Group I-1 or I-2 occupancies where the clinical needs of persons receiving care require their containment. Controlled egress doors shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors are installed and operate in accordance with all of the following: 1. The door locks shall unlock on actuation of the automatic sprinkler system or automatic fire detection system. 2. The door locks shall unlock on loss of power controlling the lock or lock mechanism. 3. The door locking system shall be installed to have the capability of being unlocked by a switch located at the fire command center, a nursing station or other approved location. The switch shall directly break power to the lock. 4. A building occupant shall not be required to pass through more than one door equipped with a controlled egress locking system before entering an exit. 5. The procedures for unlocking the doors shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code. 6. All clinical staff shall have the keys, codes or other means necessary to operate the locking systems. 7. Emergency lighting shall be provided at the door. 8. The door locking system units shall be listed in accordance with UL 294. **Exceptions:** 1. Items 1 through 4 shall not apply to doors to areas occupied by persons who, because of clinical needs, require restraint or containment as part of the function of a psychiatric or cognitive treatment area.		X			Clarification

<table>
<tr><th colspan="7">TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY</th><th colspan="3">COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td></td><td>2. Items 1 through 4 shall not apply to doors to areas where a listed egress control system is utilized to reduce the risk of child abduction from nursery and obstetric areas of a Group I-2 hospital.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>E92-18</td><td>1020.5 Air movement in corridors. Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.
Exceptions:
1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted, provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of 1,000 square feet (93 m^2) or less in area, utilization of corridors for conveying return air is permitted.
4. Transfer air movement required to maintain pressurization difference within health care facilities in accordance with ~~Section 407.1 of the International Mechanical Code.~~ ASHRAE 170.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>E105-18</td><td>TABLE 1029.13.2.1
SMOKE-PROTECTED OR OPEN-AIR ASSEMBLY AISLE ACCESSWAYS
<table>
<tr><th rowspan="3">~~TOTAL~~ NUMBER OF SEATS IN THE SMOKE-PROTECTED OR OPEN-AIR ASSEMBLY SEATING</th><th colspan="4">MAXIMUM NUMBER OF SEATS PER ROW PERMITTED TOHAVE A MINIMUM 12-INCH CLEAR WIDTH AISLE ACCESSWAY</th></tr>
<tr><th colspan="2">Aisle or doorway at both ends of row</th><th colspan="2">Aisle or doorway at one end of row only</th></tr>
<tr><th>Seats with backrests</th><th>Seats without backrests</th><th>Seats with backrests</th><th>Seats without backrests</th></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact

CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	Less than 4,000 | 14 | 21 | 7 | 10 4,000 to 6,999 | 15 | 22 | 7 | 10 7,000 to 9,999 | 16 | 23 | 8 | 11 10,000 to 12,999 | 17 | 24 | 8 | 11 13,000 to 15,999 | 18 | 25 | 9 | 12 16,000 to 18,999 | 19 | 26 | 9 | 12 19,000 to 21,999 | 20 | 27 | 10 | 13 22,000 and greater | 21 | 28 | 11 | 14 For SI: 1 inch = 25.4 mm.					
E121-18	**SECTION 202** **DEFINITIONS** **ELECTRIC VEHICLE CHARGING STATION.** One or more vehicle spaces served by an electric vehicle charging system. **406.2.7 Electric vehicle charging ~~stations~~ systems.** Where provided, electric vehicle charging ~~stations~~ systems shall be installed in accordance with NFPA 70. Electric vehicle charging system equipment shall be listed and labeled in accordance with UL 2202. Electric vehicle supply equipment shall be listed and labeled in accordance with UL 2594. Accessibility to electric vehicle charging stations shall be provided in accordance with Chapter 11. **SECTION 1106** **PARKING AND PASSENGER LOADING FACILITIES** **Add new text as follows:** **1106.1 General.** Parking shall comply with Section 1106.2 through 1106.7. Passenger loading zones shall comply with Section 1106.8. **SECTION 1107** **MOTOR VEHICLE RELATED FACILITIES** **1107.1 General.** Electrical vehicle charging stations shall comply with Section 1107.2. Fuel-dispensing systems shall comply with Section 1107.3. **1107.2 Electrical vehicle charging stations.** Electrical vehicle charging stations shall comply with Sections 1107.2.1 and 1107.2.2. **Exception:** Electrical vehicle charging stations provided to serve Groups R-2, R-3			X	Minimal	Clarifies and amends the list of Electric Vehicle charging station, parking and passenger loading facilities, and motor vehicle related facilities

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	and R-4 occupancies are not required to comply with this section. **1107.2.1 Number of accessible vehicle spaces.** At least five percent (5%) of vehicle spaces on the site served by electrical vehicle charging systems but, not fewer than one for each type of electric vehicle charging system shall be accessible. **1107.2.2 Vehicle space size.** Accessible vehicle spaces shall comply with the requirements for a van accessible parking space that is 132 inches (3350 mm) minimum in width with an adjoining access aisle that is 60 inches (1525 mm) minimum in width. **Revise as follows:** **~~1109.14~~ 1107.3 Fuel-dispensing systems.** Fuel-dispensing systems shall be accessible.					
E123-18	**1107.5.1.1 Accessible units in Group I-1, Condition 1.** In Group I-1, Condition 1, at least 4 percent, but not less than one, of the *dwelling units* and *sleeping units* shall be *Accessible units*. **Exceptions:** 1. ~~In not more than 50 percent of the Accessible units, water~~ Water closets shall not be required to comply with ICC A117.1 where such water closets comply with Section 1109.2.2, in not more than 50 percent of the Accessible units. 2. ~~In not more than 50 percent of the Accessible units, roll-in type~~ Roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.3, in not more than 50 percent of the Accessible units. **1107.5.1.2 Accessible units in Group I-1, Condition 2.** In Group I-1,Condition 2, at least 10 percent, but not less than one, of the dwelling units and sleeping units shall be Accessible units. **Exceptions:** 1. ~~In not more than 50 percent of the Accessible units, water~~ Water closets shall not be required to comply with ICC A117.1 where such water closets comply with Section 1109.2.2, in not more than 50 percent of the Accessible units.			X	Minimal	Scoping and technical criteria to allow for assisted toileting and bathing in some types of care facilities

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	2. ~~In not more than 50 percent of the Accessible units, roll-in-type~~ Roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.3, in not more than 50 percent of the Accessible units. [Accessibility- does not apply to Florida]					
E124-18	**1107.5.2.1 Accessible units.** At least 50 percent but not less than one of each type of the *dwelling units* and *sleeping units* shall be *Accessible units*. **Exceptions:** 1. ~~In not more than 90 percent of the Accessible units, water~~ Water closets shall not be required to comply with ICC A117.1 where such water closets comply with Section 1109.2.2, in not more than 90 percent of the accessible units. 2. ~~In not more than 90 percent of the Accessible units, roll-in-type~~ Roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.3, in not more than 90 percent of the Accessible units. [Accessibility- does not apply to Florida]			X	Minimal	Scoping and technical criteria to allow for assisted toileting and bathing in some types of care facilities
E125-18	**1107.5.4 Group I-2 rehabilitation facilities.** In hospitals and rehabilitation facilities of Group I-2 occupancies that specialize in treating conditions that affect mobility, or units within either that specialize in treating conditions that affect mobility, 100 percent of the *dwelling units* and *sleeping units* shall be *Accessible units*. **Exceptions:** 1. ~~In not more than 50 percent of the Accessible units, water~~ Water closets shall not be required to comply with ICC A 117.1 where such water closets comply with Section 1109.2.2, in not more than 50 percent of Accessible units. ~~2. In not more than 50 percent of the Accessible units, roll-in-type~~ Roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.3, in not more than 50 percent of Accessible units. [Accessibility- does not apply to Florida]			X	Minimal	Scoping and technical criteria to allow for assisted toileting and bathing in some types of care facilities

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
E128-18	**1109.2 Toilet and bathing facilities.** Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. Except as provided for in Sections ~~1109.2.2~~ 1109.2.3 and ~~1109.2.3~~ 1109.2.4, at least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible. **Exceptions:** 1. Toilet rooms or bathing rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, shall be permitted to comply with the specific exceptions in ICC A117.1. 2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107. 3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible. 4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be accessible. 5. Toilet rooms or bathing rooms that are part of critical care or intensive care patient sleeping rooms serving Accessible units are not required to be accessible. 6. Toilet rooms or bathing rooms designed for bariatrics patients are not required to comply with the toilet room and bathing room requirement in ICC A117.1. The sleeping units served by bariatrics toilet or bathing rooms shall not count toward the required number of Accessible sleeping units. 7. Where permitted in Section 1107, in toilet rooms or bathrooms serving Accessible units, water closets designed for assisted toileting shall comply with Sections 1109.2.2.			X	Minimal	Scoping and technical criteria to allow for assisted toileting and bathing in some types of care facilities

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	8. Where toilet facilities are primarily for children's use, required accessible water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1. **1109.2.2 Water closets designed for assisted toileting.** Water closets designed for assisted toileting shall comply with Section 1109.2.2.1 through 1109.2.2.6. **1109.2.2.1 Location.** The centerline of the water closet shall be 24 inches (610 mm) minimum and 26 inches maximum (660 mm) from one side of the required clearance. **1109.2.2.2 Clearance.** Clearance around the water closet shall comply with Section 1109.2.2.2.1 through 1109.2.2.2.3 **1109.2.2.2.1 Clearance width.** Clearance around a water closet shall be 66 inches (1675 mm) minimum in width, measured perpendicular from the side of the clearance that is 24 inches (610 mm) minimum and 26 inches (660 mm) maximum from the water closet centerline. **1109.2.2.2.2 Clearance depth.** Clearance around the water closet shall be 78 inches (1980 mm) minimum in depth, measured perpendicular from the rear wall **1109.2.2.2.3 Clearance overlap.** The required clearance around the water closet shall be permitted overlaps per ICC A117.1 Section 604.3.3 **1109.2.2.3 Height.** The height of the water closet seats shall comply with ICC A117.1 Section 604.4. **1109.2.2.4 Swing–up grab bars.** The swing-up grab bars shall comply with ICC A117.1 Sections 609.2 and 609.8. Swing–up grab bars shall be provided on both sides of the water closet and shall comply with all of the following: 1. The centerline of the grab bar shall be 14 inches minimum to 16inches (356 to 405 mm) maximum from the centerline of the water closet 2. The length of the grab bar is 36 inches (915 mm) minimum in length, measured from the rear wall to the end of the grab bar. 3. The top of the grab bar in the down position is 30 inches (760 mm) minimum and 34 inches (865 mm) maximum above the floor.					

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	1109.2.2.5 Flush controls. Flush controls shall comply with ICC A117.1 Section 604.6. **1109.2.2.6 Dispensers**. Toilet paper dispensers shall be mounted on at least one of the swing-up grab bars and the outlet of the dispenser shall be located at 24 inches (610 mm) minimum to 36 inches (915 mm) maximum from the rear wall.					
E129-18	**1109.2 Toilet and bathing facilities.** Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. Except as provided for in Sections ~~1109.2.2~~ 1109.2.4 and ~~1109.2.3~~1109.2.5, at least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible. **Exceptions:** 1. Toilet rooms or bathing rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, shall be permitted to comply with the specific exceptions in ICC A117.1. 2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107. 3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible. 4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be accessible. 5. Toilet rooms or bathing rooms that are part of critical care or intensive care patient sleeping rooms serving Accessible units are not required to be accessible. 6. Toilet rooms or bathing rooms designed for bariatrics patients are not required to comply with the toilet room and bathing room requirement in ICC A117.1. The			X	Minimal	Scoping and technical criteria to allow for assisted toileting and bathing in some types of care facilities

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	sleeping units served by bariatrics toilet or bathing rooms shall not count toward the required number of Accessible sleeping units. 7. Where permitted in Section 1107, in bathrooms serving Accessible units, showers designed for assisted toileting shall comply with Section 1109.2.3. 8. Where toilet facilities are primarily for children's use, required accessible water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1. **1109.2.3 Standard roll-in-type shower compartment designed for assisted bathing.** Standard roll-in-type shower compartments designed for assisted bathing shall comply with Section 1109.2.3.1 through 1109.2.3.8. **1109.2.3.1 Size.** Standard roll-in-type shower compartments shall have a clear inside dimension of 60 inches (1525 mm) minimum in width and 30 inches (760 mm) minimum in depth, measured at the center point of opposing sides. An entry 60 inches (1525 mm) minimum in width shall be provided. **1109.2.3.2 Clearance.** A clearance of 60 inches (1525 mm) minimum in length adjacent to the 60-inch (1525 mm) width of the open face of the shower compartment, and 30 inches (760 mm) minimum in depth, shall be provided. **Exceptions:** 1. A lavatory complying with Section 606 shall be permitted at one end of the clearance. 2. Where the shower compartment exceeds minimum sizes, the clear floor space shall be placed adjacent to the grab bars and 30 inches minimum from the back wall.					

	1109.2.3.3 Grab bars. Grab bars shall comply with ICC A117.1 Section 609 and shall be provided in accordance with Section 1109.2.3.3.1 and 1109.2.3.3.2. In standard roll-in type shower compartments, grab bars shall be provided on three walls. Where multiple grab bars are used, required horizontal grab bars shall be installed at the same height above the floor. Grab bars can be separate bars or one continuous bar. **1109.2.3.3.1 Back-wall grab bar.** The back-wall grab bar shall extend the length of the back wall and extend within 6 inches (150 mm) maximum from the two adjacent side walls. **Exception:** The back wall grab bar shall not be required to exceed 48 inches (1220 mm) in length. The rear grab bar shall be located with one end within 6 inches maximum of a side wall with a grab bar complying with Section 1109.2.3.3.2. **1109.2.3.3.2 Side-wall grab bars.** The side wall grab bars shall extend the length of the wall and extend within 6 inches (150 mm) maximum from the adjacent back wall. **Exceptions:** 1. The side-wall grab bar shall not be required to exceed 30 inches (760 mm) in length. The side grab bar shall be located with one end within 6 inches maximum of the back wall with a grab bar complying with Section 1109.2.3.3.1. 2. Where the side walls are located 72 inches (1830 mm) or greater apart, a grab bar is not required on one of the side-walls. **1109.2.3.4 Seats.** Wall-mounted folding seats shall not be installed. **1109.2.3.5 Controls and hand showers.** In standard roll-in-type showers, the controls and hand shower shall be located 38 inches (965 mm) minimum and 48 inches (1220 mm) maximum above the shower floor. Controls shall be located to facilitate caregiver access. **1109.2.3.6 Hand showers.** Hand showers shall comply with ICC A117.1 Section 608.5. **1109.2.3.7 Thresholds.** Thresholds shall comply with ICC A117.1 Section 608.6. **1109.2.3.8 Shower enclosures.** Shower compartment enclosures for shower compartments shall comply with ICC A117.1 Section 608.7.					

TABLE 9. 2021 I-Codes Fire Protection and Life Safety Changes Cost Impact						
CODE CHANGE #	2021 I-CODES FIRE PROTECTION AND LIFE SAFETY CHANGE SUMMARY	COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	1109.2.3.9 Water temperature. Water temperature shall comply with ICC A117.1 Section 608.8.					
E130-18	**1109.6 Bottle filling stations.** Where bottle filling stations are provided, they shall be accessible. **Exception:** Bottle filling stations over drinking fountains for standing persons are not required to be accessible provided bottle filling stations are also located over the drinking fountains for persons using wheelchairs. [Accessibility- does not apply to Florida]		X			Necessary addition for clarification
E133-18	**1109.13 Controls, operating mechanisms and hardware.** Controls, operating mechanisms and hardware intended for operation by the occupant, including switches that control lighting and ventilation and electrical convenience outlets, in accessible spaces, along accessible routes or as parts of accessible elements shall be accessible. **Exceptions:** 1. Operable parts that are intended for use only by service or maintenance personnel shall not be required to be accessible. ~~2. Electrical or communication receptacles serving a dedicated use shall not be required to be accessible.~~ ~~3. Where two or more outlets are provided in a kitchen above a length of counter top that is uninterrupted by a sink or appliance, one outlet shall not be required to be accessible.~~ ~~4. Floor electrical receptacles shall not be required to be accessible.~~ ~~5. HVAC diffusers shall not be required to be accessible.~~ ~~6. Except for light switches, where redundant controls are provided for a single element, one control in each space shall not be required to be accessible.~~ 2~~7~~. Access doors or gates in barrier walls and fences protecting pools, spas and hot tubs shall be permitted to comply with Section 1010.1.9.2. 3.Operable parts exempted in accordance with ICC A117.1 are not required to be accessible. [Accessibility- does not apply to Florida]		X			Removes redundant language

APPENDIX J

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
S1-18	**[P] 1502.1 General.** Design and installation of roof drainage systems shall comply with this Section and Section ~~1502~~ 1611 of this code ~~and Sections 1106 and 1108, as applicable,~~ and Chapter 11 of the International Plumbing Code. **[P] 1502.2 Secondary (emergency overflow) drains or scuppers.** Where roof drains are required, secondary (emergency overflow) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. The installation and sizing of secondary emergency overflow drains, leaders and conductors shall comply with ~~Sections 1106 and 1108, as applicable,~~ Section 1611 of this code and Chapter 11 of the International Plumbing Code.		X			Clarification
S3-18	**[BF] 1505.8 Building-integrated photovoltaic (BIPV) products.** ~~Building-integrated photovoltaic~~ BIPV products installed as the roof covering shall be tested, listed and labeled for fire classification in accordance with Section 1505.1. **[BF] 1505.9 Rooftop-mounted photovoltaic (PV) panel systems.** Rooftop ~~rack~~-mounted photovoltaic (PV) panel systems shall be tested, listed and identified with a fire classification in accordance with UL 1703 and UL 2703. The fire classification shall comply with Table 1505.1 based on the type of construction of the building.		X			Clarification
S4-18	**1505.9 Roof top mounted photovoltaic panel systems.** Rooftop rack-mounted photovoltaic panel systems shall be tested, listed and identified with a fire classification in accordance with UL 1703 and UL 2703. ~~Listed systems shall include roof-mounting hardware.~~ Listed systems shall be installed in accordance with the manufacturer's installation instructions and its listing. The fire classification shall comply with Table 1505.1 based on the type of construction of the building.			X	Unknown-UL input awaited	Clarification
S9-18	**[BF] 1508.1 General.** The use of above-deck thermal insulation shall be permitted provided that such insulation is covered with an approved roof covering and passes the tests of NFPA 276 or UL 1256 when tested as an assembly. **Exceptions:** 1. Foam plastic roof insulation shall conform to the material and installation requirements of Chapter 26. 2. Where a concrete or composite metal and concrete roof deck is used and the above-deck thermal insulation is covered with an approved roof covering.		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
S11-18	~~**[BG]**~~ **1510.2.4 Type of construction.** Penthouses shall be constructed ~~with walls, floors and roofs~~ of building elements as required for the type of construction of the building on which such penthouses are built. **Exceptions:** 1. On buildings of Type I construction, the exterior walls and roofs of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall not be required to have a fire-resistance rating. 2. On buildings of Type I construction two stories or less in height above grade plane or of Type II construction, the exterior walls and roofs of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table 602 and be constructed of fire-retardant-treated wood. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall be permitted to be constructed of fire-retardant-treated wood and shall not be required to have a fire-resistance rating. Interior framing and walls shall be permitted to be constructed of fire-retardant-treated wood. 3. On buildings of Type III, IV or V construction, the exterior walls of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table 602. On buildings of Type III, IV or VA construction, the exterior walls of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall be permitted to be of heavy timber construction complying with Sections 602.4 and 2304.11 or noncombustible construction or fire-retardant-treated wood and shall not be required to have a fire-resistance rating.		X			Clarification
S13-18	~~**[BG] 1510.7 Photovoltaic panels and modules.** Rooftop-mounted photovoltaic panels and modules shall be designed in accordance with this section.~~		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~[BG]~~ ~~1510.7.1~~ ~~Fire classification.~~ ~~Rooftop-mounted photovoltaic panels and modules shall have the fire classification in accordance with Section 1505.9.~~ **~~[BG]~~ ~~1510.7.2~~ ~~Photovoltaic panels and modules.~~** ~~Rooftop-mounted photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703 and shall be installed in accordance with the manufacturer's instructions.~~ **~~SECTION~~ ~~1512~~** **~~PHOTOVOLTAIC PANELS AND MODULES~~** **~~1512.1~~ ~~Photovoltaic panels and modules.~~** ~~Photovoltaic panels and modules installed on a roof or as an integral part of a roof assembly shall comply with the requirements of this code and the International Fire Code.~~					
S14-18	**[Reserved under FBC]** **[BF] 1705.14 Sprayed fire-resistant materials.** Special inspections and tests of sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Sections 1705.14.1 through 1705.14.6. Special inspections shall be based on the fire-resistance design as designated in the approved construction documents. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. Special inspections and tests shall be performed after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, <u>and before concealed,</u> where applicable.		X			Clarification
S15-18	**[Reserved under FBC]** **[BF] 1705.14 Sprayed fire-resistant materials.** Special inspections and tests of sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Sections 1705.14.1 through 1705.14.6. Special inspections shall be based on the fire-resistance design as designated in the approved construction documents. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. Special inspections and tests shall be performed <u>during construction with an addition visual inspection</u> after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, where applicable.		X			Clarification
S16-18	**[Reserved under FBC]**		X			Clarification

<table>
<tr><th colspan="7">Table 10. 2021 IBC STRUCTURAL Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IBC STRUCTURAL CHANGE SUMMARY</th><th colspan="3">IBC STRUCTURAL COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>[BF] 1705.14 Sprayed fire-resistant materials. Special inspections and tests of sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Sections 1705.14.1 through 1705.14.6. Special inspections shall be based on the fire-resistance design as designated in the approved construction documents. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. Special inspections and tests shall be performed after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, where applicable. <u>The required sample size shall not exceed 110% of that specified by the referenced standards in Sections 1705.14.4.1 through 1704.14.4.9.</u></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>S19-18</td><td>[Reserved under FBC]
1705.15 Mastic and intumescent fire-resistant coatings. Special inspections and tests for mastic and intumescent fire-resistant coatings applied to structural elements and decks shall be performed in accordance with AWCI 12-B. Special inspections and tests shall be based on the fire-resistance design as designated in the approved construction documents. Special Inspections and tests shall be performed <u>during construction with an additional visual inspection</u> after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, and before concealed, where applicable.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>S21-18</td><td>[Reserved under FBC]
[BF] 1705.17 Fire-resistant penetrations and joints. In high-rise buildings ~~or~~ <u>,</u> in buildings assigned to Risk Category III or IV<u>, or fire areas containing Group R occupancies with an occupant load greater than 250</u>, special inspections for through-penetrations, membrane penetration firestops, fire-resistant joint systems and perimeter fire barrier systems that are tested and listed in accordance with Sections 714.4.1.2, 714.5.1.2, 715.3 and 715.4 shall be in accordance with Section 1705.17.1 or 1705.17.2.</td><td></td><td></td><td>X</td><td>Minimal depending on QC</td><td>Clarification</td></tr>
<tr><td>FS1-19</td><td>[BS] PORCELAIN TILE. ~~Tile that conforms to the requirements of ANSI A137.1.3, Section 3.0 for ceramic~~ <u>Ceramic</u> tile having an absorption of 0.5 percent or less in accordance with ANSI A137.1, ~~Section 4.1 and Section 6.1 Table 10.~~<u>Table 10 or ANSI A137.3, Tables 4 or 5.</u>

TABLE 1404.2
MINIMUM THICKNESS OF WEATHER COVERINGS
Portions of table not shown remain unchanged.
<table>
<tr><th>COVERING TYPE</th><th>MINIMUM THICKNESS (inches)</th></tr>
<tr><td>Porcelain tile</td><td>~~0.25~~ <u>0.125 nominal</u></td></tr>
</table></td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	For SI: 1 inch = 25.4 mm, 1 ounce = 28.35 g, 1 square foot = 0.093 m^2. a. Wood siding of thicknesses less than 0.5 inch shall be placed over sheathing that conforms to Section 2304.6. b. Exclusive of texture. c. As measured at the bottom of decorative grooves. d. 16 ounces per square foot for cold-rolled copper and lead-coated copper, 12 ounces per square foot for copper shingles, high-yield copper and lead-coated high-yield copper. [BS] 1404.10.2 Exterior adhered masonry veneers—porcelain tile. Adhered units weighing more than 3.5 pounds per square foot (0.17 kN/m^2) shall not exceed ~~$^5/_8$ inch (15.8 mm) thickness and 24 inches (610~~ 48 inches (1219 mm) in any face dimension nor more than ~~3~~ 9 square feet ~~(0.28~~ (0.8 m^2) in total face area and shall not weigh more than ~~9 pounds psf (0.43~~ 6 pounds per square foot (0.29 kN/m^2). Adhered units weighing less than or equal to 3.5 pounds per square foot (0.17 kN/m^2) shall not exceed 72 inches (1829 mm) in any face dimension nor more than 17.5 square feet (1.6 m^2) in total face area. *Porcelain tile* shall be adhered to an approved backing system.					
FS2-19	**Nailable Substrate.** A product or material such as framing, sheathing, or furring, composed of wood or wood-based materials or other materials providing equivalent fastener withdrawal resistance. **[BS] 1404.14.1 Application.** The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform to the *water-resistive barrier* requirements in Section 1402. Siding and accessories shall be installed in accordance with *approved* manufacturer's instructions. Unless otherwise specified in the *approved* manufacturer's instructions, nails used to fasten the siding and accessories shall have a minimum 0.313-inch (7.9 mm) head diameter and $^1/_8$-inch (3.18 mm) shank diameter. The nails shall be corrosion resistant and shall be long enough to penetrate a nailable substrate not less than ~~3/4 inch (19 mm)~~ 1 1/4- inch (32 mm). For cold-formed steel light-frame construction, corrosion-resistant fasteners shall be used. Screw fasteners shall penetrate the cold-formed steel framing not fewer than three exposed threads. Other fasteners shall be installed in accordance with the *approved* construction documents and manufacturer's instructions. Where the siding is installed horizontally, the fastener spacing shall not exceed 16 inches (406 mm) horizontally and 12 inches (305 mm) vertically. Where the siding is installed vertically,		X			Clarification

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		Decrease	None	Increase		
Sub Code:						
	the fastener spacing shall not exceed 12 inches (305 mm) horizontally and 12 inches (305 mm) vertically.					
FS3-19	**[BS] 1404.14 Vinyl siding.** Vinyl siding conforming to the requirements of this section and complying with ASTM D3679 shall be permitted on *exterior walls* where the design wind pressure determined in accordance with Section ~~1609.3.1~~ 1609 does not exceed 30 psf. Where the design wind pressure exceeds 30 psf, tests or calculations indicating compliance with Chapter 16 shall be submitted. Vinyl siding shall be secured to the building so as to provide weather protection for the *exterior walls* of the building. **1404.14.1.1 Fasteners and fastener penetration for wood construction.** Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding and accessories shall be corrosion resistant and have a minimum 0.313-inch (7.9 mm) head diameter and 1/8-inch (3.18 mm) shank diameter. The ~~total penetrative~~ penetration into nailable substrate shall be ~~not less than~~ at least 1 1/4 ~~inch "~~ inches (32 mm). **1404.14.1.2 Fasteners and fastener penetration for cold-formed steel light ~~fame~~ frame construction.** For cold-formed steel light-frame ~~light-framed~~ construction, corrosion resistant fasteners shall be used. Screw fasteners shall penetrate ~~the cold-formed steel framing at least three exposed threads~~ through the steel with a minimum of three exposed threads. Other fasteners shall be installed in accordance with the approved construction documents and manufacturer's instructions. **1404.14.1~~.2~~.3 Fastener spacing.** Unless specified otherwise by the approved manufacturer's instructions, fasteners shall be installed in the ~~center~~ middle third of the slots of the nail hem and maximum spacing between fasteners shall be 16 inches (406 mm) for horizontal siding and 12 inches (305 mm) for vertical siding.			X	Minimal	Clarification
G2-19	**[BS] DANGEROUS.** Any building, structure or portion thereof that meets any of the conditions described below shall be deemed dangerous: 1. The building or structure has collapsed, has partially collapsed, has moved off its foundation or lacks the necessary support of the ground. 2. There exists a significant risk of collapse, detachment or dislodgment of any portion, member, appurtenance or ornamentation of the building or structure under ~~service loads.~~ permanent, routine, or frequent loads; under actual		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	loads already in effect; or under snow, wind, rain, flood, earthquake, or other environmental loads when such loads are imminent. **[BS] DANGEROUS.** Any building, structure or portion thereof that meets any of the conditions described below shall be deemed dangerous: 1. The building or structure has collapsed, has partially collapsed, has moved off its foundation, or lacks the necessary support of the ground. 2. There exists a significant risk of collapse, detachment or dislodgement of any portion, member, appurtenance or ornamentation of the building or structure under ~~service loads.~~ permanent, routine, or frequent loads; under actual loads already in effect; or under snow, wind, rain, flood, earthquake, or other environmental loads when such loads are imminent.					
G3-19	**[BS] DEAD LOAD.** The weight of materials of construction incorporated into the building, including, but not limited		X			Clarification
G4-19 Part I	**GLASS MAT GYPSUM PANEL.** A gypsum panel consisting of a noncombustible core primarily of gypsum, surfaced with glass mat partially or completely embedded in the core. **GYPSUM SHEATHING.** Gypsum panel products specifically manufactured with enhanced water resistance for use as a substrate for exterior surface materials. **GYPSUM WALLBOARD.** A gypsum board used primarily as an interior surfacing for building structures.		X			Necessary addition for clarification
G4-19 Part II	**GLASS MAT GYPSUM PANEL.** A gypsum panel consisting of a noncombustible core primarily of gypsum, surfaced with glass mat partially or completely embedded in the core. **GYPSUM SHEATHING.** Gypsum panel products specifically manufactured with enhanced water resistance for use as a substrate for exterior surface materials. **GYPSUM WALLBOARD.** A gypsum board used primarily as an interior surfacing for building structures.		X			Clarification
G5-19	**[BS] GYPSUM BOARD.** The generic name for a family of sheet products consisting of a noncombustible core primarily of gypsum with paper surfacing. ~~Gypsum wallboard, gypsum sheathing, gypsum~~		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
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		Decrease	None	Increase		
Sub Code:						
	~~base for gypsum veneer plaster, exterior gypsum soffit board, predecorated gypsum board and water-resistant gypsum backing board complying with the standards listed in Tables 2506.2, 2507.2 and Chapter 35 are types of gypsum board.~~ **[BS] GYPSUM PANEL PRODUCT.** The general name for a family of sheet products consisting essentially of gypsum complying with the standards specified in Tables 2506.2 and 2507.2, and Chapter 35. Gypsum board and glass mat gypsum panels are examples of gypsum panel products. **[BS] GYPSUM BOARD.** ~~Gypsum wallboard, gypsum sheathing, gypsum base for gypsum veneer plaster, exterior gypsum soffit board, predecorated gypsum board or water-resistant gypsum backing board complying with the standards listed in Tables 2506.2 and 2507.2 and Chapter 35 of the International Building Code.~~ The generic name for a family of sheet products consisting of a noncombustible core primarily of gypsum with paper surfacing.					
G8-19	**[BS] POSITIVE ROOF DRAINAGE.** ~~The drainage condition in which an evaluation is required for all loading deflections of the roof deck, and additional slope shall be provided to ensure drainage of the roof within 48 hours of precipitation.~~ A design that accounts for deflections from all design loads and has sufficient additional slope to ensure that drainage of the roof occurs within 48 hours of precipitation.		X			Clarification
G9-19	**[BF] STEEP SLOPE.** A roof slope ~~greater than~~ two units vertical in 12 units horizontal (17-percent slope) or greater.		X			Clarification
G10-19	~~**[BS] TREATED WOOD.** Wood products that are conditioned to enhance fire-retardant or preservative properties.~~ **FIRE-RETARDANT-TREATED WOOD.** Wood products that, when impregnated with chemicals by a pressure process or other means during manufacture, exhibit reduced surface-burning characteristics and resist propagation of fire. **PRESERVATIVE-TREATED WOOD.** Wood products that, when impregnated with chemicals by a pressure process or other means during manufacture, exhibit reduced susceptibility to damage by fungi, insects or marine borers.		X			Clarification
G11-19	**Underpinning.** The alteration of an existing foundation to transfer loads to a lower elevation using new piers, piles, or other permanent structural support elements installed below the existing foundation.		X			Necessary addition for clarification

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		Decrease	None	Increase		
Sub Code:						
G12-19 Part I	**[BS] WINDBORNE DEBRIS REGION.** Areas within hurricane-prone regions located: 1. Within 1 mile (1.61 km) of the ~~coastal~~ mean high-water line, where an Exposure D condition exists upwind at the waterline and the basic design wind speed, *V*, is 130 mph (58 m/s) or greater; or 2. In areas where the basic design wind speed is 140 mph (63.6 m/s) or greater. For *Risk Category* II buildings and structures and Risk Category III buildings and structures, except health care facilities, the windborne debris region shall be based on Figure 1609.3.(1). For *Risk Category* IV buildings and structures and *Risk Category* III health care facilities, the windborne debris region shall be based on Figure 1609.3(2).		X			Clarification
G12-19 Part II	**[RB] WINDBORNE DEBRIS REGION.** Areas within *hurricane-prone regions* located in accordance with one of the following: 1. Within 1 mile (1.61 km) of the ~~coastal~~ mean high-water line where an Exposure D condition exists upwind at the waterline and the ultimate design wind speed, V_{ult}, is 130 mph (58 m/s) or greater. 2. In areas where the ultimate design wind speed, V_{ult}, is 140 mph (63.6 m/s) or greater; or Hawaii.		X			Clarification
G13-19	**[BS] 403.2.3 Structural integrity of interior exit stairways and elevator hoistway enclosures.** For *high-rise buildings of Risk Category* III or IV in accordance with Section 1604.5, and for all buildings that are more than 420 feet (128 m) in *building height*, enclosures for *interior exit stairways* and elevator hoistway enclosures shall comply with Sections 403.2.3.1 through 403.2.3.4. **[BS] 403.2.3.1 Wall assembly materials - Soft Body Impact.** The ~~wall assemblies~~ panels making up the enclosures for *interior exit stairways* and elevator hoistway enclosures shall meet or exceed Soft Body Impact Classification Level 2 as measured by the test method described in ASTM C1629/C1629M. **[BS] 403.2.3.2 Wall assembly materials - Hard Body Impact.** The ~~face of the wall assemblies~~ panels making up the enclosures for *interior exit stairways* and elevator hoistway enclosures that are not exposed to the interior of the enclosures for *interior exit stairways* or elevator hoistway enclosure shall be ~~constructed~~ in accordance with one of the following ~~methods~~: The wall assembly shall incorporate ~~not~~ no fewer than two layers of impact-resistant ~~construction board~~ panels, each of which meets or exceeds Hard Body Impact Classification Level 2 as measured by the test method described in ASTM C1629/C1629M.		X			Clarification

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Sub Code:						
	The wall assembly shall incorporate ~~not~~ no fewer than one layer of impact-resistant ~~construction material~~ panels that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M. The wall assembly incorporates multiple layers of any material, tested in tandem, that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M. **[BS] 403.2.3.3 Concrete and masonry walls.** Concrete or masonry walls shall be deemed to satisfy the requirements of Sections 403.2.3.1 and 403.2.3.2. **[BS] 403.2.3.4 Other wall ~~assemblies~~ materials.** Any other wall ~~assembly~~ materials that ~~provides~~ provide impact resistance equivalent to that required by Sections 403.2.3.1 and 403.2.3.2 for Hard Body Impact Classification Level 3, as measured by the test method described in ASTM C1629/C1629M, shall be permitted.					
G14-19	[BS] 403.2.3.2 Wall assembly materials. The ~~exterior~~ face of the wall assemblies making up the enclosures for *interior exit stairways* and elevator hoistway enclosures that is not exposed to the interior of the enclosures shall be constructed in accordance with one of the following methods: 1. The wall assembly shall incorporate not fewer than two layers of impact-resistant construction board each of which meets or exceeds Hard Body Impact Classification Level 2 as measured by the test method described in ASTM C1629/C1629M. 2. The wall assembly shall incorporate not fewer than one layer of impact-resistant construction material that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M. 3. The wall assembly incorporates multiple layers of any material, tested in tandem, that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M. [BS] 403.2.3.4 Other wall assemblies. Any other wall assembly that provides impact resistance equivalent to that required by Sections 403.2.3.1 for Soft Body Impact Classification Level ~~3~~2 and 403.2.3.2 for Hard Body Impact Classification Level 3, as measured by the test method described in ASTM C1629/C1629M, shall be permitted.		X			Clarification
G15-19	**3307.2 Excavation retention systems.** Where a ~~retaining~~ retention system is used to provide support of an excavation for protection of adjacent *structures*, the system shall conform to the requirements in Section 3307.2.1 through 3307.2.3.		X			Clarification

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Sub Code:						
	3307.2.1 Excavation retention system design. Excavation retention systems shall be designed by a registered design professional to provide vertical and lateral support. **3307.2.2 Excavation retention system monitoring.** The retention system design shall include requirements for monitoring of the system and adjacent structures for horizontal and vertical movement. ~~The earth retention system design shall be modified as determined by the monitoring.~~ **3307.2.3 Retention system removal.** Elements of the system shall only be removed or decommissioned when adequate replacement support is provided by backfill or by the new structure. Removal or decommissioning shall be performed in such a manner that protects the adjacent property.					
G16-19	**[Reserved under FBC]** **G101.5 Designation of floodplain administrator.** The [INSERT JURISDICTION'S SELECTED POSITION TITLE] is designated as the floodplain administrator and is authorized and directed to enforce the provisions of this appendix. The floodplain administrator is authorized to delegate performance of certain duties to other employees of the jurisdiction. Such designation shall not alter any duties and powers of the building official. **G103.1 Permit applications.** All applications for permits ~~must~~ shall comply with the following: 1. The ~~*building official*~~ floodplain administrator shall review all permit applications to determine whether proposed development is located in flood hazard areas established in Section G102.2. 2. Where a proposed development site is in a flood hazard area, all development to which this appendix is applicable as specified in Section G102.1 shall be designed and constructed with methods, practices and materials that minimize flood damage and that are in accordance with this code and ASCE 24.		X			Clarifies and amends the Designation of floodplain administrator list

	G103.2 Other permits. It shall be the responsibility of the ~~*building official*~~ floodplain administrator to ensure that approval of a proposed development shall not be given until proof that necessary permits have been granted by federal or state agencies having jurisdiction over such development. **G103.3 Determination of design flood elevations.** If design flood elevations are not specified, the ~~*building official*~~ floodplain administrator is authorized to require the applicant to meet one of the following: 1. Obtain, review and reasonably utilize data available from a federal, state or other source. 2. Determine the design flood elevation in accordance with accepted hydrologic and hydraulic engineering techniques. Such analyses shall be performed and sealed by a registered design professional. Studies, analyses and computations shall be submitted in sufficient detail to allow review and approval by the ~~*building official.*~~ floodplain administrator. The accuracy of data submitted for such determination shall be the responsibility of the applicant. **G103.4 Activities in riverine flood hazard areas.** In riverine flood hazard areas where design flood elevations are specified but floodways have not been designated, the ~~*building official*~~ floodplain administrator shall not permit any new construction, substantial improvement or other development, including fill, unless the applicant submits an engineering analysis prepared by a registered design professional, demonstrating that the cumulative effect of the proposed development, when combined with all other existing and anticipated flood hazard area encroachment, will not increase the design flood elevation more than 1 foot (305 mm) at any point within the community. **G103.5 Floodway encroachment.** Prior to issuing a permit for any floodway encroachment, including fill, new construction, substantial improvements and other development or land-disturbing activity, the ~~*building official*~~ floodplain administrator shall require submission of a certification, prepared by a registered design professional, along with supporting technical data, demonstrating that such development will not cause any increase of the base flood level. **G103.6 Watercourse alteration.** Prior to issuing a permit for any alteration or relocation of any watercourse, the ~~*building official*~~ floodplain administrator shall require the applicant to provide notification of the proposal to the appropriate authorities of all adjacent government jurisdictions, as well as appropriate state agencies. A copy of the notification shall be maintained in the permit records and submitted to FEMA. **G103.6.1 Engineering analysis.** The ~~*building official*~~ floodplain administrator shall require submission of an engineering analysis, prepared by a registered design professional, demonstrating that the					

	flood-carrying capacity of the altered or relocated portion of the watercourse will not be decreased. Such watercourses shall be maintained in a manner that preserves the channel's flood-carrying capacity. **G103.7 Alterations in coastal areas.** Prior to issuing a permit for any alteration of sand dunes and mangrove stands in coastal high-hazard areas and coastal A zones, the ~~*building official*~~ floodplain administrator shall require submission of an engineering analysis, prepared by a registered design professional, demonstrating that the proposed alteration will not increase the potential for flood damage. **G103.8 Records.** The ~~*building official*~~ floodplain administrator shall maintain a permanent record of all permits issued in flood hazard areas, including supporting certifications and documentation required by this appendix and copies of inspection reports, design certifications and documentation of elevations required in Section 1612 of this code and Section R322 of the International Residential Code. **G103.9 Inspections.** Development for which a permit under this appendix is required shall be subject to inspection. The ~~*building official*~~ floodplain administrator or the ~~*building official's*~~ floodplain administrator's designee shall make, or cause to be made, inspections of all development in flood hazard areas authorized by issuance of a permit under this appendix. **G104.1 Required.** Any person, owner or owner's authorized agent who intends to conduct any development in a flood hazard area shall first make application to the ~~*building official*~~ floodplain administrator and shall obtain the required *permit*. **G104.2 Application for permit.** The applicant shall file an application in writing on a form furnished by the ~~*building official.*~~ floodplain administrator. Such application shall: 1. Identify and describe the development to be covered by the permit. 2. Describe the land on which the proposed development is to be conducted by legal description, street address or similar description that will readily identify and definitely locate the site. 3. Include a site plan showing the delineation of flood hazard areas, floodway boundaries, flood zones, design flood elevations, ground elevations, proposed fill and excavation and drainage patterns and facilities. 4. Include in subdivision proposals and other proposed developments with more than 50 lots or larger than 5 acres (20 234 m2), base flood elevation data in accordance with Section 1612.3.1 if such data are not identified for the flood hazard areas established in Section G102.2. 5. Indicate the use and occupancy for which the proposed development is intended.					

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		Decrease	None	Increase		
Sub Code:						
	6. Be accompanied by construction documents, grading and filling plans and other information deemed appropriate by the ~~*building official*~~ floodplain administrator. 7. State the valuation of the proposed work. 8. Be signed by the applicant or the applicant's authorized agent. **G104.3 Validity of permit.** The issuance of a permit under this appendix shall not be construed to be a permit for, or approval of, any violation of this appendix or any other ordinance of the jurisdiction. The issuance of a permit based on submitted documents and information shall not prevent the ~~*building official*~~ floodplain administrator from requiring the correction of errors. The ~~*building official*~~ floodplain administrator is authorized to prevent occupancy or use of a structure or site that is in violation of this appendix or other ordinances of this jurisdiction. **G104.4 Expiration.** A permit shall become invalid if the proposed development is not commenced within 180 days after its issuance, or if the work authorized is suspended or abandoned for a period of 180 days after the work commences. Extensions shall be requested in writing and justifiable cause demonstrated. The ~~*building official*~~ floodplain administrator is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. **G104.5 Suspension or revocation.** The ~~*building official*~~ floodplain administrator is authorized to suspend or revoke a permit issued under this appendix wherever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or code of this jurisdiction. **G105.2 Records.** The ~~*building official*~~ floodplain administrator shall maintain a permanent record of all variance actions, including justification for their issuance. **G105.7 Conditions for issuance.** Variances shall only be issued by the board of appeals where all of the following criteria are met: 1. A technical showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site renders the elevation standards inappropriate. 2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable. 3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety,					

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	extraordinary public expense, nor create nuisances, cause fraud on or victimization of the public or conflict with existing local laws or ordinances. 4. A determination that the variance is the minimum necessary, considering the flood hazard, to afford relief. 5. Notification to the applicant in writing over the signature of the ~~building official~~ floodplain administrator that the issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as $25 for $100 of insurance coverage, and that such construction below the base flood level increases risks to life and property.					
G17-19	**[Reserved under FBC]** **G103.10 Use of changed technical data.** The ~~building official~~ floodplain administrator and the applicant shall not use changed flood hazard area boundaries or base flood elevations for proposed buildings or developments unless the ~~building official~~ floodplain administrator or applicant has applied for a conditional Flood Insurance Rate Map (FIRM) revision and has received the approval of the Federal Emergency Management Agency (FEMA).		X			Clarification
G18-19	**[Reserved under FBC]** **G105.1 General.** The ~~jurisdiction shall establish or designate a board to~~ board of appeals established pursuant to Section 113, or other established or designated board, shall hear and decide requests for variances. The board shall base its determination on technical justifications, and has the right to attach such conditions to variances as it deems necessary to further the purposes and objectives of this appendix and Section 1612.		X			Clarification
G19-19	**[Reserved under FBC]** **G105.4 Functionally dependent facilities ~~uses~~.** A variance is authorized to be issued for the construction or substantial improvement of a ~~structure and for other development necessary for the conduct of a~~ functionally dependent facility ~~use~~ provided that the criteria in Section 1612.1 are met and the variance is the minimum necessary to allow the construction or substantial improvement, and that all due consideration has been given to methods and materials that minimize flood damages during the design flood and do not create additional threats to public safety. **G201.2 Definitions.** **DEVELOPMENT.** Any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, temporary structures, temporary or permanent storage of materials,		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	mining, dredging, filling, grading, paving, excavations, operations and other land-disturbing activities. **FUNCTIONALLY DEPENDENT FACILITY ~~USE~~.** A facility ~~use~~ that cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities necessary for the loading or unloading of cargo or passengers, and shipbuilding and ship repair facilities. The term does not include long-term storage, manufacture, sales or service facilities.					
G20-19	**[Reserved under FBC]** **G201.2 Definitions.** **MANUFACTURED HOME.** A structure that is transportable in one or more sections, built on a permanent chassis, designed for use with or without a permanent foundation when attached to the required utilities, and constructed to the Federal ~~Mobile~~ Manufactured Home Construction and Safety Standards and rules and regulations promulgated by the U.S. Department of Housing and Urban Development. The term also includes mobile homes, park trailers, travel trailers and similar transportable structures that are placed on a site for 180 consecutive days or longer. **SECTION G1101** **REFERENCED STANDARDS** HUD 24 CFR Part 3280 (~~2008~~ 2018) | Manufactured Home Construction and Safety Standards | G201		X			Clarification
S5-19	**1511.3 Roof replacement.** *Roof replacement* shall include the removal of all existing layers of ~~roof coverings and~~ roof assembly materials down to the roof deck. **Exception:** Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.		X			Clarification
S10-19	**1511.5 Reinstallation of materials.** Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing vent flashing, metal edgings, drain outlets, collars and metal counterflashings shall not be reinstalled where rusted, damaged or deteriorated. ~~Aggregate~~ Existing ballast that is damaged, cracked or broken shall not be reinstalled. Existing aggregate surfacing materials from built-up roofs shall not be reinstalled.	X			Cost savings by Reusing aggregate ballast	Clarification

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		Decrease	None	Increase		
Sub Code:						
S12-19	**1503.3.1 Fire-resistance-rated parapet walls.** Parapet walls required by section 705.11 shall be coped or covered with ~~non-combustible,~~ weatherproof materials of a width not less than the thickness of the parapet wall such that the fire resistance rating of the wall is not decreased.		X			Clarification
S13-19	**1503.3.1 Fire-resistance-rated parapet walls.** Parapet walls required by section 705.11 shall be coped or covered with ~~non-combustible,~~ weatherproof materials of a width not less than the thickness of the parapet wall such that the fire resistance rating of the wall is not decreased.	X			Cost reduction of $5-10/ LF if no metal coping	Clarification
S14-19	**1504.2 Wind resistance of clay and concrete tile.** Wind loads on clay and concrete tile roof coverings shall be in accordance with Section 1609.5. **1504.2.1 Testing.** Testing of concrete and clay roof tiles shall be in accordance with Sections 1504.2.1.1, 1504.2.1.2 and ~~1504.2.1.2.~~1504.2.1.3. **1504.2.1.1 Overturning resistance.** Concrete and clay roof tiles shall be tested to determine their resistance to overturning due to wind in accordance with Chapter 15 and either SBCCI SSTD 11 or ASTM C1568. **1504.2.1.2 Wind tunnel testing.** Where concrete and clay roof tiles do not satisfy the limitations in Chapter 16 for rigid tile, a wind tunnel test shall be used to determine the wind characteristics of the concrete or clay tile roof covering in accordance with Chapter 15 and either SBCCI SSTD 11 ~~and Chapter 15~~ or ASTM C1569. **1504.2.1.3 Air permeability testing.** The lift coefficient for concrete and clay tile shall be 0.2 or shall be determined in accordance with SBCCI SSTD 11 or ASTM C1570.		X			Clarification
S15-19	**1504.4 Ballasted low-slope single-ply roof systems.** Ballasted low-slope (roof slope < 2:12) single-ply roof system coverings installed in accordance with Sections 1507.12 and 1507.13 shall be designed in accordance with ~~Section 1504.8 and~~ ANSI/SPRI RP-4.		X			Clarification

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		Decrease	None	Increase		
Sub Code:						
	1504.8 Surfacing and ballast materials in hurricane-prone regions. For a building located in a hurricane-prone region as defined in Section 202, or on any other building with a mean roof height exceeding that permitted by Table 1504.8 based on the exposure category and basic wind speed at the site, the following materials shall not be used on the roof: 1. Aggregate used as surfacing for roof coverings. 2. Aggregate, gravel or stone used as ballast. **Exception:** Ballasted single-ply roof systems complying with Section 1504.4					
S16-19	**1504.5 Edge systems for low-slope roofs.** Metal edge systems, except gutters and counterflashing, installed on built-up, modified bitumen and single-ply roof systems having a slope less than 2:12, shall be designed and installed for wind loads in accordance with Chapter 16 and tested for resistance in accordance with Test Methods RE-1, RE-2 and RE-3 of ANSI/SPRI ES-1, except basic design wind speed, V, shall be determined from Figures 1609.3(1) through 1609.3(8) as applicable.		X			Clarification
S17-19	**1504.5.1 Gutter securement for low-slope roofs.** ~~External gutters~~ Gutters that are used to secure the perimeter edge of the roof membrane on low-slope (less than 2:12 slope) built-up, modified bitumen, and single ply roofs, shall be designed, constructed and installed to resist wind loads in accordance with Section 1609 and shall be tested in accordance with Test Methods G-1 and G-2 of SPRI GT-1.			X	$0.06/LF	Clarification
S18-19	**1504.7 Impact resistance.** Roof coverings installed on low-slope roofs (roof slope < 2:12) in accordance with Section 1507 shall resist impact damage based on the results of tests conducted in accordance with ASTM D3746, ASTM D4272 or the "Resistance to Foot Traffic Test" in ~~Section 5.5 of~~ FM 4470.		X			Clarification
S21-19	**1504.8 Wind resistance of aggregate-surfaced roofs.** Parapets shall be provided for aggregate surfaced roofs and shall comply with Table 1504.8. **TABLE 1504.8 MINIMUM REQUIRED PARAPET HEIGHT (INCHES) FOR AGGREGATE SURFACED ROOFS**			X	Minimal depending o design conditions	Clarification
S22-19	**1506.1 Scope.** The requirements set forth in this section shall apply to the application of roof-covering materials specified herein. Roof coverings shall be applied in accordance with this chapter and the roof covering listing as required by Section 1505. Installation of roof coverings shall comply with the applicable provisions of Section 1507.		X			Clarification

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Sub Code:						
S24-19	1507.1.1 Underlayment. Underlayment for asphalt shingles, clay and concrete tile, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, metal roof panels and *photovoltaic shingles* shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a label indicating compliance with the standard designation and, if applicable, type classification indicated in Table 1507.1.1(1). Underlayment shall be applied in accordance with Table 1507.1.1(2). Underlayment shall be attached in accordance with Table 1507.1.1(3). **Exceptions:** ~~1. As an alternative, self-adhering polymer modified bitumen underlayment complying with ASTM D1970 and installed in accordance with the manufacturer's installation instructions for the deck material, roof ventilation configuration and climate exposure for the roof covering to be installed shall be permitted.~~ ~~2.~~1. As an alternative, a minimum 4-inch-wide (102 mm) strip of self-adhering polymer modified bitumen membrane complying with ASTM D1970 and installed in accordance with the manufacturer's installation instructions for the deck material shall be applied over all joints in the roof decking. An approved underlayment for the applicable roof covering for design wind speeds less than 120 mph (54 m/s) shall be applied over the 4-inch-wide (102 mm) membrane strips. ~~3.~~2. As an alternative, two layers of underlayment complying with ASTM D226 Type II or ASTM D4869 Type IV shall be permitted to be installed as follows: Apply a 19-inch (483 mm) strip of underlayment parallel with the eave. Starting at the eave, apply 36-inch-wide (914 mm) strips of underlayment felt, overlapping successive sheets 19 inches (483 mm). The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at side and end laps. End laps shall be 4 inches (102 mm) and shall be offset by 6 feet (1829 mm). Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch (25.4 mm). Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (mm). The cap nail shank shall be not less than 0.083 inch for		X			Clarification

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CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
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Sub Code:						
	ring shank cap nails and 0.091 inch (mm) for smooth shank cap nails. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^3/_4$ inch (19.1 mm) into the roof sheathing. ~~4.~~3. Structural metal panels that do not require a substrate or underlayment.					
S25-19	**1507.3.1 Deck requirements.** Concrete and clay tile shall be installed only over solid ~~structural~~ sheathing ~~boards~~. **Exception:** Spaced lumber sheathing shall be permitted in Seismic Design Categories A, B and C.		X			Clarification
S28-19	**1507.3.6 Fasteners.** Tile fasteners shall be corrosion resistant and not less than 11-gage, [0.120 inch (3 mm)], $^5/_{16}$-inch (8.0 mm) head, and of sufficient length to penetrate the deck not less than $^3/_4$ inch (19.1 mm) or through the thickness of the deck, whichever is less. Attaching wire for clay or concrete tile shall not be smaller than 0.083 inch (2.1 mm). Perimeter fastening areas include three tile courses but not less than 36 inches (914 mm) from either side of hips or ridges and edges of eaves and gable rakes.		X			Clarification
S31-19	**TABLE 1507.12.2** **SINGLE-PLY ROOFING MATERIAL STANDARDS** **MATERIAL** / **MATERIAL STANDARD** Chlorosulfonated polyethylene (CSPE) or polyisobutylene (PIB) — ASTM D5019 Ethylene propylene diene monomer (EPDM) — ASTM D4637 Ketone Ethylene Ester (KEE) — ASTM D6754 Polyvinyl Chloride (PVC) or (PVC/KEE) — ASTM D4434 Thermoplastic polyolfin (TPO) — ASTM D6878		X			Clarification
S32-19	**1507.15 Liquid-applied roofing.** The installation of liquid-applied roofing shall comply with the provisions of this section. **1507.15.1 Slope.** Liquid-applied roofing shall have a design slope of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope). **1507.15.2 Material standards.** Liquid-applied roofing shall comply with ASTM C836, ASTM C957~~, ASTM D1227~~ or ASTM ~~D3468, ASTM D6083, ASTM D6694 or ASTM D6947~~ D3468.		X			Clarification
S33-19 Part I	**TABLE 1504.1.1** **CLASSIFICATION OF STEEP SLOPE ROOF SHINGLES TESTED IN ACCORDANCE WITH ASTM D3161 OR D7158**		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IBC STRUCTURAL CHANGE SUMMARY</th><th colspan="3">IBC STRUCTURAL COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="8">Sub Code:</td></tr>
<tr><td></td><td>
<table>
<tr><th>MAXIMUM BASIC WIND SPEED, V, FROM FIGURES 1609.3(1)-(8) OR ASCE 7(mph)</th><th>MAXIMUM ALLOWABLE STRESS DESIGN WIND SPEED,V_{asd}, FROM TABLE 1609.3.1 (mph)</th><th>ASTM D7158[a] CLASSIFICATION</th><th>ASTM D3161 <u>or UL 7103</u> CLASSIFICATION</th></tr>
<tr><td>110</td><td>85</td><td>D, G or H</td><td>A, D or F</td></tr>
<tr><td>116</td><td>90</td><td>D, G or H</td><td>A, D or F</td></tr>
<tr><td>129</td><td>100</td><td>G or H</td><td>A, D or F</td></tr>
<tr><td>142</td><td>110</td><td>G or H</td><td>F</td></tr>
<tr><td>155</td><td>120</td><td>G or H</td><td>F</td></tr>
<tr><td>168</td><td>130</td><td>H</td><td>F</td></tr>
<tr><td>181</td><td>140</td><td>H</td><td>F</td></tr>
<tr><td>194</td><td>150</td><td>H</td><td>F</td></tr>
</table>
For SI: 1 foot = 304.8 mm; 1 mph = 0.447 m/s.
a. The standard calculations contained in ASTM D7158 assume Exposure Category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.
</td><td></td><td></td><td></td><td></td></tr>
<tr><td>S33-19 Part II</td><td>
TABLE R905.16.6
Classification of Photovoltaic Shingles
<table>
<tr><th>MAXIMUM ULTIMATE DESIGN WIND SPEED, V_{ult}FROM FIGURE R301.2(5)A (mph)</th><th>MAXIMUM BASIC WIND SPEED,V_{ASD} FROM TABLE R301.2.1.3(mph)</th><th><s>UL 7103[a] SHINGLE CLASSIFICATION</s></th><th>UL 7103 SHINGLE CLASSIFICATION</th></tr>
<tr><td>110</td><td>85</td><td><s>D, G or H</s></td><td>A, D or F</td></tr>
<tr><td>116</td><td>90</td><td><s>D, G or H</s></td><td>A, D or F</td></tr>
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<tr><td>142</td><td>110</td><td><s>G or H</s></td><td>F</td></tr>
<tr><td>155</td><td>120</td><td><s>G or H</s></td><td>F</td></tr>
<tr><td>168</td><td>130</td><td><s>H</s></td><td>F</td></tr>
<tr><td>181</td><td>140</td><td><s>H</s></td><td>F</td></tr>
<tr><td>194</td><td>150</td><td><s>H</s></td><td>F</td></tr>
</table>
<s>a. The standard calculations contained in UL7103 assume Exposure Category B or C and a building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.</s>
</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>S34-19 Part I</td><td>
[BG] 1510.7.2 Photovoltaic panels and modules. Rooftop-mounted photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703<u>, or with both UL 61730-1</u> and <u>UL 61730-2, and</u> shall be installed in accordance with the manufacturer’s instructions.

1507.17.6 Material standards. Photovoltaic shingles shall be listed and labeled in accordance with UL 1703 <u>or with both UL 61730-1 and UL 61730-2</u>.
</td><td></td><td>X</td><td></td><td></td><td>Provides an alternate compliance option</td></tr>
</table>

<table>
<tr><th colspan="6">Table 10. 2021 IBC STRUCTURAL Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IBC STRUCTURAL CHANGE SUMMARY</th><th colspan="3">IBC STRUCTURAL COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>1507.18.5 Material standards. BIPV roof panels shall be listed and labeled in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2.

3111.3.1 Equipment. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>S34-19 Part II</td><td>R324.3.1 Equipment listings. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

R905.16.4 Material standards. Photovoltaic shingles shall be listed and labeled in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2.

R905.17.5 Material standards. BIPV roof panels shall be listed and labeled in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>S35-19</td><td>TABLE 1509.2
ROOF COATING MATERIAL STANDARDS
<table><tr><th>MATERIAL</th><th>STANDARD</th></tr><tr><td>Acrylic coating</td><td>ASTM D6083</td></tr><tr><td>Asphaltic emulsion coating</td><td>ASTM D1227</td></tr><tr><td>Asphalt coating</td><td>ASTM D2823</td></tr><tr><td>Asphalt roof coating</td><td>ASTM D4479</td></tr><tr><td>Aluminum-pigmented asphalt coating</td><td>ASTM D2824</td></tr><tr><td>Silicone coating</td><td>ASTM D6694</td></tr><tr><td>Moisture-cured polyurethane coating</td><td>ASTM D6947</td></tr></table></td><td></td><td>X</td><td></td><td></td><td>Provides an alternate compliance option</td></tr>
<tr><td>S36-19</td><td>[BS] LIVE LOAD, ROOF. A load on a roof produced:

1. During maintenance by workers, equipment and materials; or
2. During the life of the structure by movable objects such as planters or other similar small decorative appurtenances that are not occupancy related.<s>; or</s>
<s>3. By the use and occupancy of the roof such as for roof gardens or assembly areas.</s></td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

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Sub Code:						
	SECTION 1602 NOTATIONS **1602.1 Notations.** The following notations are used in this chapter: *D* = Dead load. D_i = Weight of ice in accordance with Chapter 10 of ASCE 7. *E* = Combined effect of horizontal and vertical earthquake induced forces as defined in Section 2.3.6 of ASCE 7. *F* = Load due to fluids with well-defined pressures and maximum heights. F_a = Flood load in accordance with Chapter 5 of ASCE 7. *H* = Load due to lateral earth pressures, ground water pressure or pressure of bulk materials. *L* = ~~Roof live load greater than 20 psf (0.96 kN/m^2) and floor live~~ Live load. L_r = Roof live load ~~of 20 psf (0.96 kN/m^2) or less~~. *R* = Rain load. *S* = Snow load. T = Cumulative effects of self-straining load forces and effects. V_{asd} = Allowable stress design wind speed, miles per hour (mph) (km/hr) where applicable. V = Basic design wind speeds, miles per hour (mph) (km/hr) determined from Figures 1609.3(1) through 1609.3(8) or ASCE 7. *W* = Load due to wind pressure. W_i = Wind-on-ice in accordance with Chapter 10 of ASCE 7.					
S39-19	**1603.1.4 Wind design data.** The following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral force-resisting system of the structure: 1. Basic design wind speed, *V*, miles per hour and allowable stress design wind speed, V_{asd}, as determined in accordance with Section 1609.3.1. 2. *Risk category*. 3. Wind exposure. Applicable wind direction if more than one wind exposure is utilized. 4. Applicable internal pressure coefficient. 5. Design wind pressures and their applicable zones with dimensions to be used for exterior component and cladding materials not specifically designed by the *registered design professional* responsible for the design of the structure, psf (kN/m^2). ~~6. Roof pressure coefficient (GC_p) zones locations and dimensions.~~		X			Clarification

<table>
<tr><th colspan="6">Table 10. 2021 IBC STRUCTURAL Changes Cost Impact</th></tr>
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<tr><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td>S40-19</td><td>SECTION 1604
GENERAL DESIGN REQUIREMENTS

1604.3 Serviceability. Structural systems and members thereof shall be designed to have adequate stiffness to limit deflections as indicated in Table 1604.3. ~~Drift limits applicable to earthquake loading shall be in accordance with ASCE 7 Chapter 12, 13, 15 or 16, as applicable.~~</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>S44-19</td><td>TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES
<table><tr><th>RISK CATEGORY</th><th>NATURE OF OCCUPANCY</th></tr><tr><td>III</td><td>Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to:
•Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300.
•Buildings and other structures containing one or more public assembly spaces, each having an occupant load greater than 300 and a cumulative occupant load of ~~the~~ these public assembly spaces of greater than 2,500.
•Buildings and other structures containing Group E occupancies with an occupant load greater than 250.
•Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500.
•Group I-2, Condition 1 occupancies with 50 or more care recipients.
•Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities.
•Group I-3 occupancies.
•Any other occupancy with an occupant load greater than 5,000.[a]
•Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV.
•Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that:
Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the International Fire Code; and
Are sufficient to pose a threat to the public if released.[b]</td></tr></table>a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.
b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.</td><td></td><td></td><td>X</td><td>More buildings fall in Risk Category III</td><td>Clarification</td></tr>
<tr><td>S45-19</td><td>TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES
Portions of table not shown remain unchanged.
<table><tr><th>RISK CATEGORY</th><th>NATURE OF OCCUPANCY</th></tr><tr><td>III</td><td>Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to:</td></tr></table></td><td></td><td></td><td>X</td><td>More buildings fall in Risk Category III</td><td>Clarification</td></tr>
</table>

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	•Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. •Buildings and other structures containing Group E or Group I-4 occupancies or combination therof, with an occupant load greater than 250. •Buildings and other structures containing educational occupancies for students above the 12th grade with an occupant load greater than 500. •Group I-2, Condition 1 occupancies with 50 or more care recipients. •Group I-2, Condition 2 occupancies not having emergency surgery or emergency treatment facilities. •Group I-3 occupancies. •Any other occupancy with an occupant load greater than 5,000.[a] •Power-generating stations, water treatment facilities for potable water, wastewater treatment facilities and other public utility facilities not included in Risk Category IV. •Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the International Fire Code ; and Are sufficient to pose a threat to the public if released.[b] a. For purposes of occupant load calculation, occupancies required by Table 1004.5 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load. b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided that it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.					
S47-19	**SECTION 1605** **LOAD COMBINATIONS** **1605.1 General.** Buildings and other structures and portions thereof shall be designed to resist the Strength Load Combinations specified in ASCE 7 Section 2.3, the Allowable Stress Design Load Combinations specified in ASCE 7 Section 2.4, or the Alternative Allowable Stress Design Load Combinations of Section 1605.2. **Exceptions:** 1. The modifications to Load Combinations of ASCE 7 Section 2.3, ASCE 7 Section 2.4, and Section 1605.2 specified in ASCE 7 Chapter 18 and 19 shall apply. 2. When the Allowable Stress Design Load Combinations of ASCE 7 Section 2.4 are used, flat roof snow loads of 30 psf		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	(1.44kN/m^2) and roof live loads of 30 psf (1.44 kN/m^2) or less need not be combined with seismic load. Where flat roof snow loads exceed 30 psf (1.44kN/m^2), 20 percent shall be combined with seismic loads. 3. Where the Allowable Stress Design Load Combinations of ASCE 7 Section 2.4 are used, crane hook loads need not be combined with roof live loads or with more than three-fourths of the snow load or one-half of the wind loads. **1605.2 Load combinations using strength design or load and resistance factor design.** **1605.2.1 Other loads.** **1605.3 Load combinations using allowable stress design.** **1605.3.1 Basic load combinations.** **1605.3.1.1 Stress increases.** **1605.3.1.2 Other loads.** **1605.2 Alternative allowable stress design load combinations.** In lieu of the Load Combinations in ASCE 7 Section 2.4, structures and portions thereof shall be permitted to be designed for the most critical effects resulting from the following combinations. Where using these alternative allowable stress load combinations that include wind or seismic loads, allowable stresses are permitted to be increased or load combinations reduced where permitted by the material chapter of this code or the referenced standards. For load combinations that include the counteracting effects of dead and wind loads, only two-thirds of the minimum dead load likely to be in place during a design wind event shall be used. Where using allowable stresses that have been increased or load combinations that have been reduced as permitted by the material chapter of this code or the referenced standards, where wind loads are calculated in accordance with Chapters 26 through 31 of ASCE 7, the coefficient (ω) in the following equations shall be taken as 1.3. For other wind loads, (ω) shall be taken as 1. Where allowable stresses have not been increased or load combinations have not been reduced as permitted by the material chapter of this code or the referenced standards, (ω) shall be taken as 1. Where using these alternative load combinations to evaluate sliding, overturning and soil bearing at the soil-structure interface, the reduction of foundation overturning					

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	from Section 12.13.4 in ASCE 7 shall not be used. Where using these alternative basic load combinations for proportioning foundations for loadings, which include seismic loads, the vertical seismic *load effect*, E_v, in Equation 12.4-4 of ASCE 7 is permitted to be taken equal to zero. Where required by ASCE 7 Chapters 12, 13, and 15, the Load Combinations including overstrength of ASCE 7 Sections 2.3.6 shall be used. **(Equation 16-1)** **(Equation 16-2)** **(Equation 16-3)** **(Equation 16-4)** **(Equation 16-5)** **(Equation 16-6)** **Exceptions:** 1. Crane hook loads need not be combined with roof live loads or with more than three-fourths of the snow load or one-half of the wind load. ~~2.~~ Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf (1.44 kN/m^2) or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads. ~~3. Where required by ASCE 7 Chapter 12, 13, and 15, the Load Combinations including overstrength of ASCE 7 Section 2.3.6 shall be used.~~ **1605.3.2.1 Other loads.** **1607.14 Crane loads.** The crane live load shall be the rated capacity of the crane. Design loads for the runway beams, including connections and support brackets, of moving bridge cranes and monorail cranes shall include the maximum wheel loads of the crane and the vertical impact, lateral and longitudinal forces induced by the moving crane. ~~Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow loads or one-half of the wind load.~~					

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
S48-19	**1605.3.2 Alternative basic load combinations.** In lieu of the basic load combinations specified in Section 1605.3.1, structures and portions thereof shall be permitted to be designed for the most critical effects resulting from the following combinations. Where using these alternative basic allowable stress load combinations that include wind or seismic loads, allowable stresses are permitted to be increased or load combinations reduced where permitted by the material chapter of this code or the referenced standards. For load combinations that include the counteracting effects of dead and wind loads, only two-thirds of the minimum dead load likely to be in place during a design wind event shall be used. Where using ~~allowable stresses that have been increased or load combinations that have been reduced as permitted by the material chapter of this code or the referenced standards, where wind loads are calculated in accordance with Chapters 26 through 31 of ASCE 7, the coefficient (ω) in the following equations shall be taken as 1.3. For other wind loads, (ω) shall be taken as 1. Where allowable stresses have not been increased or load combinations have not been reduced as permitted by the material chapter of this code or the referenced standards, (ω) shall be taken as 1. Where using~~ these alternative load combinations to evaluate sliding, overturning and soil bearing at the soil-structure interface, the reduction of foundation overturning from Section 12.13.4 in ASCE 7 shall not be used. Where using these alternative basic load combinations for proportioning foundations for loadings, which include seismic loads, the vertical seismic *load effect*, E_v, in Equation 12.4-4 of ASCE 7 is permitted to be taken equal to zero. $D + L + (L_r \text{ or } S \text{ or } R)$ **(Equation 16-17)** $D + L + 0.6\,\omega W$ $D + L + 0.6W$ **(Equation 16-18)** ~~$D + L + 0.6\,\omega W + S/2$~~ $D + L + 0.6W + S/2$ **(Equation 16-19)** $D + L + S + 0.6\,\omega W/2$ $D + L + S + 0.6W/2$ **(Equation 16-20)** $D + L + S + E/1.4$ **(Equation 16-21)** $0.9D + E/1.4$ **(Equation 16-22)** **Exceptions**: 1. Crane hook loads need not be combined with roof live loads or with more than three-fourths of the snow load or one-half of the wind load.		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	2. Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf (1.44 kN/m^2) or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.					
S49-19	**1606.2 ~~Design dead load.~~** Weights of materials of construction. For purposes of design, the actual weights of materials of construction ~~and fixed service equipment~~ shall be used. In the absence of definite information, values used shall be subject to the approval of the *building official*. **1606.3 Weight of fixed service equipment.** In determining dead loads for purposes of design, the weight of fixed service equipment, including the maximum weight of the contents of fixed service equipment, shall be included. The components of fixed service equipment that are variable, such as liquid contents and movable trays, shall not be used to counteract forces causing overturning, sliding, and uplift conditions in accordance with Section 1.3.6 of ASCE 7. **Exceptions:** 1. Where force effects are the result of the presence of the variable components, the components are permitted to be used to counter those load effects. In such cases, the structure shall be designed for force effects with the variable components present and with them absent. 2. For the calculation of seismic force effects, the components of fixed service equipment that are variable, such as liquid contents and movable trays, need not exceed those expected during normal operation.		X			Clarifies how to handle equipment & coordinates for ASCE 7
S50-19	**1606.3 Photovoltaic panel systems.** The weight of photovoltaic panel systems, their support system, and ballast shall be considered as dead load.		X			Clarification
S51-19	**1606.3 Vegetative and landscaped roofs.** The weight of all landscaping and hardscaping materials for vegetative and landscaped roofs shall be considered as dead load. The weight shall be computed considering both fully saturated soil and drainage layer materials and fully dry soil and drainage layer materials to determine the most severe load effects on the structure.		X			Clarification
S53-19	**TABLE 1607.1** **MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L0, AND MINIMUM CONCENTRATED LIVE LOADS[g]** *Portions of table not shown remain unchanged.* OCCUPANCY OR USE / UNIFORM (psf) / CONCENTRATED (pounds)		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	4. Assembly areas — Fixed seats (fastened to floor) 60[m] Follow spot, projections and control rooms 50 Lobbies 100[m] Movable seats 100[m] Stage floors 150[n] Platforms (assembly) 100[m] Reviewing stands, grandstands and bleachers 100[c,m] Stadiums and arenas with fixed seats (fastened to the floor) 60[c,m] Other assembly areas 100[m] 24. Recreational uses: — Bowling alleys, poolrooms and similar uses 75[m] Dance halls and ballrooms 100[m] Gymnasiums 100[m] Ice skating rink 250[n] ~~Reviewing stands, grandstands and bleachers 100[c, m]~~ Roller skating rink 100[m] ~~Stadiums and arenas with fixed seats (fastened to floor) 60[c, m]~~ c. Design in accordance with ICC 300. m. Live load reduction is not permitted.					
S54-19	**TABLE 1607.1** **MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L0, AND MINIMUM CONCENTRATED LIVE LOADS[g]** *Portions of table not shown remain unchanged.* **OCCUPANCY OR USE** | **UNIFORM (psf)** | **CONCENTRATED (pounds)** ~~g. Where snow loads occur that are in excess of the design conditions, the structure shall be designed to support the loads due to the increased loads caused by drift buildup or a greater snow design determined by the building official (see Section 1608).~~		X			Clarification
S55-19	**TABLE 1607.1** **MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_0, AND MINIMUM CONCENTRATED LIVE LOADS[g]** **OCCUPANCY OR USE** | **UNIFORM (psf)** | **CONCENTRATED (pounds)** 6. Catwalks for maintenance and service access | 40 | 300 35. Yards and terraces, pedestrian | 100[m] | —		X			Clarification
S56-19	**TABLE 1607.1** **MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L0 , AND MINIMUM CONCENTRATED LIVE LOADS[g]**			X	Minimal for fixed ladders	Coordinates requirements for fixed ladders in the

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Portions of table not shown remain unchanged. **OCCUPANCY OR USE** | **UNIFORM (psf)** | **CONCENTRATED (pounds)** 14. Fixed ladders | See Section 1607.16 | **1607.16 Fixed ladders.** Fixed ladders with rungs shall be designed to resist a single concentrated load of 300 lb (1.33 kN) in accordance with Section 4.5.4 of ASCE 7. Where rails of fixed ladders extend above a floor or platform at the top of the ladder, each side rail extension shall be designed to resist a single concentrated load of 100 lb (0.445 kN) in accordance with Section 4.5.4 of ASCE 7. Ships ladders shall be designed to resist the stair loads given in Table 1607.1. **1011.15 Ships ladders.** Ships ladders are permitted to be used in Group I-3 as a component of a *means of egress* to and from control rooms or elevated facility observation stations not more than 250 square feet (23 m^2) with not more than three occupants and for access to unoccupied roofs. The minimum clear width at and below the *handrails* shall be 20 inches (508 mm). Ships ladders shall be designed for the live loads indicated in Section 1607.16 **1011.16 Ladders.** Permanent ladders shall not serve as a part of the *means of egress* from occupied spaces within a building. Permanent ladders shall be constructed in accordance with Section 306.5 of the International Mechanical Code and designed for the live loads indicated in Section 1607.16. Permanent ladders shall be permitted to provide access to the following areas: 1. Spaces frequented only by personnel for maintenance, repair or monitoring of equipment. 2. Nonoccupiable spaces accessed only by catwalks, crawl spaces, freight elevators or very narrow passageways. 3. Raised areas used primarily for purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands. 4. Elevated levels in Group U not open to the general public. 5. Nonoccupied roofs that are not required to have *stairway* access in accordance with Section 1011.12.1. 6. Where permitted to access equipment and appliances in accordance with Section 306.5 of the International Mechanical Code.					IBC with the referenced design load standard, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE 7)

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
S57-19	**TABLE 1607.1 MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L0, AND MINIMUM CONCENTRATED LIVE LOADS** ~~a. Floors in garages or portions of buildings used for the storage of motor vehicles shall be designed for the uniformly distributed live loads of this table or the following concentrated loads: (1) for garages restricted to passenger vehicles accommodating not more than nine passengers, 3,000 pounds acting on an area of $4^{1}/_{2}$inches by $4^{1}/_{2}$inches; (2) for mechanical parking structures without slab or deck that are used for storing passenger vehicles only, 2,250 pounds per wheel.~~ ~~b. The loading applies to stack room floors that support nonmobile, double-faced library book stacks, subject to the following limitations:~~ ~~1. The nominal book stack unit height shall not exceed 90 inches.~~ ~~2. The nominal shelf depth shall not exceed 12 inches for each face.~~ ~~3. Parallel rows of double-faced book stacks shall be separated by aisles not less than 36 inches wide.~~ c. Design in accordance with ICC 300. ~~d. Other uniform loads in accordance with an approved method containing provisions for truck loadings shall be considered where appropriate.~~ ~~e. The concentrated wheel load shall be applied on an area of 4.5 inches by 4.5 inches.~~ ~~f. The minimum concentrated load on stair treads shall be applied on an area of 2 inches by 2 inches. This load need not be assumed to act concurrently with the uniform load.~~ g. Where snow loads occur that are in excess of the design conditions, the structure shall be designed to support the loads due to the increased loads caused by drift buildup or a greater snow design determined by the building official (see Section 1608). h. See Section 1604.8.3 for decks attached to exterior walls. ~~i. Uninhabitable attics without storage are those where the maximum clear height between the joists and rafters is less than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirements.~~ ~~j. Uninhabitable attics with storage are those where the maximum~~		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~clear height between the joists and rafters is 42 inches or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses.~~ ~~The live load need only be applied to those portions of the joists or truss bottom chords where both of the following conditions are met:~~ ~~i. The attic area is accessible from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the attic is not less than 30 inches.~~ ~~ii. The slopes of the joists or truss bottom chords are not greater than two units vertical in 12 units horizontal.~~ ~~The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed concurrent live load of not less than 10 pounds per square foot.~~ ~~k. Attic spaces served by stairways other than the pull-down type shall be designed to support the minimum live load specified for habitable attics and sleeping rooms.~~ l. Areas of occupiable roofs, other than roof gardens and assembly areas, shall be designed for appropriate loads as approved by the building official. Unoccupied landscaped areas of roofs shall be designed in accordance with Section 1607.13.3. m. Live load reduction is not permitted. n. Live load reduction is only permitted in accordance with Section 1607.11.1.2 or Item 1 of Section 1607.11.2. o. Live load reduction is only permitted in accordance with Section 1607.11.1.3 or Item 2 of Section 1607.11.2. **1607.7 Passenger vehicle garages.** Floors in garages or portions of a building used for the storage of motor vehicles shall be designed for the uniformly distributed live loads indicated in Table 1607.1 or the following concentrated load: 1. For garages restricted to passenger vehicles accommodating not more than nine passengers, 3,000 pounds (13.35 kN) acting on an area of 4.5 inches by 4.5 inches(114 mm by 114 mm). 2. For mechanical parking structures without slab or deck that are used for storing passenger vehicles only, 2,250 pounds (10 kN) per wheel.					

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~**1607.7**~~ **1607.8 Heavy vehicle loads.** Floors and other surfaces that are intended to support vehicle loads greater than a 10,000-pound (4536 kg) gross vehicle weight rating shall comply with Sections 1607.7.1 through 1607.7.5. **1607.17 Library stack rooms.** The live loading indicated in Table 1607.1 for library stack rooms applies to stack room floors that support nonmobile, double-faced library book stacks, subject to the following limitations: 1. The nominal book stack unit height shall not exceed 90 inches (2,290 mm). 2. The nominal shelf depth shall not exceed 12 inches (305 mm) for each face. 3. Parallel rows of double-faced book stacks shall be separated by aisles not less than 36 inches (914 mm) wide. **1607.18 Sidewalks, vehicular driveways, and yards subject to trucking.** The live loading indicated in Table 1607.1 for sidewalks, vehicular driveways, and yards subject to trucking shall comply with the requirements of this section. **1607.18.1 Uniform loads.** In addition to the loads indicated in Table 1607.1, other uniform loads in accordance with an approved method which contains provisions for truck loading, shall be considered where appropriate. **1607.18.2 Concentrated loads.** The concentrated wheel load indicated in Table 1607.1 shall be applied on an area of 4.5 inches by 4.5 inches (114 mm by 114 mm). **1607.19 Stair treads.** The concentrated load indicated in Table 1607.1 for stair treads shall be applied on an area of 2 inches by 2 inches (51 mm by 51 mm). This load need not be assumed to act concurrently with the uniform load. **1607.20 Residential Attics** The live loads indicated in Table 1607.1 for attics in residential occupancies shall comply with the requirements of this section.					

<table>
<tr><th colspan="7">Table 10. 2021 IBC STRUCTURAL Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IBC STRUCTURAL CHANGE SUMMARY</th><th colspan="3">IBC STRUCTURAL COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td><u>1607.20.1 Uninhabitable attics without storage.</u> <u>In residential occupancies, uninhabitable attic areas without storage are those where the maximum clear height between the joists and rafters is less than 42 inches (1067 mm), or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches (1067 mm) in height by 24 inches (610 mm) in width, or greater, within the plane of the trusses. The live load in Table 1607.1 need not be assumed to act concurrently with any other live load requirement.</u>

<u>1607.20.2 Uninhabitable attics with storage.</u> <u>In residential occupancies, uninhabitable attic areas with storage are those where the maximum clear height between the joist and rafter is 42 inches (1067 mm) or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches (1067 mm) in height by 24 inches (610 mm) in width, or greater, within the plane of the trusses. The live load in Table 1607.1 need only be applied to those portions of the joists or truss bottom chords where both of the following conditions are met:</u>

1. The attic area is accessed from an opening not less than 20 inches (508 mm) in width by 30 inches (762 mm) in length that is located where the clear height in the attic is not less than 30 inches (762 mm).
<u>2. The slope of the joists or truss bottom chords is not greater than two units vertical in 12 units horizontal.</u>

<u>The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed concurrent live load of not less than 10 pounds per square foot (0.48 kN/m^2).</u>

<u>1607.20.3 Attics served by stairs.</u> <u>Attic spaces served by stairways other than the pull-down type shall be designed to support the minimum live load specified for habitable attics and sleeping rooms.</u></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>S58-19</td><td>TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L0 , AND MINIMUM CONCENTRATED LIVE LOADS[g]

Portions of table not shown remain unchanged.
<table><tr><th>OCCUPANCY OR USE</th><th>UNIFORM (psf)</th><th>CONCENTRATED (pounds)</th></tr><tr><td>24. Recreational uses:</td><td></td><td>—</td></tr><tr><td>Bowling alleys, poolrooms and similar uses</td><td>75[m]</td><td></td></tr><tr><td>Dance halls and ballrooms</td><td>100[m]</td><td></td></tr></table></td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

<table>
<tr><th colspan="7">Table 10. 2021 IBC STRUCTURAL Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IBC STRUCTURAL CHANGE SUMMARY</th><th colspan="3">IBC STRUCTURAL COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>
<table>
<tr><td>Gymnasiums</td><td>100[m]</td><td></td></tr>
<tr><td>Ice skating rink</td><td>250[n]</td><td></td></tr>
<tr><td>~~Reviewing stands,~~ Bleachers, folding and telescopic seating and grandstands ~~and bleachers~~</td><td>100[c, m] (see Section 1607.16)</td><td></td></tr>
<tr><td>Roller skating rink</td><td>100[m]</td><td></td></tr>
<tr><td>Stadiums and arenas with fixed seats (fastened to floor)</td><td>60[c, m] (see Section 1607.16)</td><td></td></tr>
</table>
~~c. Design in accordance with ICC 300~~.

<u>1607.16</u> <u>Seating for assembly uses.</u> <u>Bleachers, folding and telescopic seating and grandstands shall be designed for the loads specified in ICC 300. Stadiums and arenas with fixed seats shall be designed for the horizontal sway loads in Section 1607.16.1.</u>

<u>1607.16.1</u> <u>Horizontal sway loads.</u> <u>The design of stadiums and arenas with fixed seats shall include horizontal swaying forces applied to each row of seats as follows:</u>

<u>1. 24 lb per linear foot (0.35 kN/m) of seat applied in a direction parallel to each row of seats, and</u>
<u>2. 10 lb per linear foot (0.15 kN/m) of seat applied in a direction perpendicular to each row of seats.</u>

<u>The parallel and perpendicular horizontal swaying forces are not required to be applied simultaneously.</u>
</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>S59-19</td><td>Committee Reason: This proposal coordinates the Roof live load item in Table 1607.1 of the IBC with the Roof live load item in Table 4.3-1 in the referenced design load standard, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE 7). Both the content and the layout of the Roof item is revised for coordination, including the associated footnote, Footnote L. The modification revises the wording for improved readability and replaces an item which was inadvertently deleted. (Vote: 14-0)</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>S61-19</td><td>TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L0 , AND MINIMUM CONCENTRATED LIVE LOADS[g]
Portions of table not shown remain unchanged.
<table>
<tr><th>OCCUPANCY OR USE</th><th>UNIFORM (psf)</th><th>CONCENTRATED (pounds)</th></tr>
<tr><td><u>31. Storage areas above ceilings</u></td><td><u>20</u></td><td></td></tr>
<tr><td>~~31~~ <u>32</u>. Storage warehouses (shall be designed for heavier loads if required for anticipated storage)</td><td></td><td>—</td></tr>
<tr><td>Heavy</td><td>250[n]</td><td></td></tr>
<tr><td>Light</td><td>125[n]</td><td></td></tr>
</table>
</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
S62-19	**TABLE 1607.1** **MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L0 , AND MINIMUM CONCENTRATED LIVE LOADS[g]** *Portions of table not shown remain unchanged.* **OCCUPANCY OR USE** / **UNIFORM (psf)** / **CONCENTRATED (pounds)** 5. Balconies and decks[h] / 1.5 times the live load for the area served, not required to exceed 100 / — ~~h. See Section 1604.8.3 for decks attached to exterior walls.~~		X			Clarification
S63-19	**1607.2 Loads not specified.** For occupancies or uses not designated in ~~Table 1607.1~~Section 1607, the live load shall be determined in accordance with a method *approved* by the *building official*.		X			Clarification
S66-19	**1607.8.1.1 Concentrated load.** Handrails and guards shall be designed to resist a concentrated load of 200 pounds (0.89 kN) in accordance with Section ~~4.5.1.1 of~~ 4.5.1 of ASCE 7.		X			Clarification
S67-19	**1607.8.1.2 ~~Intermediate rails.~~ Guard component loads.** ~~Intermediate rails (all those except the handrail), balusters and panel fillers shall~~ Balusters, panel fillers, and guard infill components, including all rails except the handrail and the top rail, shall be designed to resist a concentrated load of 50 pounds (0.22 kN) in accordance with Section ~~4.5.1.1 of~~ 4.5.1.2 of ASCE 7.		X			Clarification
S68-19	**1607.8.2 Grab bars, shower seats and accessible benches ~~bench seats~~.** Grab bars, shower seats and *accessible* benches ~~bench seats~~ shall be designed to resist a single concentrated load of 250 pounds (1.11 kN) applied in any direction at any point on the grab bar, ~~or~~ shower seat, or seat of the accessible bench so as to produce the maximum load effects.		X			Clarification
S69-19	**1607.10.4 Fall arrest and lifeline anchorages.** In addition to any other applicable live loads, fall arrest and lifeline anchorages and structural elements that support these anchorages shall be designed for a live load of not less than 3,100 pounds (13.8 kN) for each attached lifeline, in ~~every~~ any direction that a fall arrest load can be applied.		X			Clarification
S70-19	**1607.10.4 Fall arrest. ~~and~~ lifeline and rope descent system anchorages.** In addition to any other applicable live loads, fall arrest ~~and lifeline~~ , lifeline, and rope descent system anchorages and structural elements that support these anchorages shall be designed for a live load of not less than 3,100 pounds (13.8 kN) for each attached ~~lifeline~~ line, in every direction that ~~a fall arrest~~ the load can be applied. Anchorages of horizontal lifelines and the structural elements that support these anchorages shall be designed for the maximum tension that develops in the horizontal lifeline from these live loads.			X	Minimal	Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
S71-19	**1607.13 Roof loads.** The structural supports of roofs and marquees shall be designed to resist wind and, where applicable, snow and earthquake loads, in addition to the dead load of construction and the appropriate live loads as prescribed in this section, or as set forth in Table 1607.1. The live loads acting on a sloping surface shall be assumed to act vertically on the horizontal projection of that surface. **1607.13.1 Distribution of roof loads.** Where uniform roof live loads are reduced to less than 20 psf (0.96 kN/m^2) in accordance with Section 1607.13.2.1 and are applied to the design of structural members arranged so as to create continuity, the reduced roof live load shall be applied to adjacent spans or to alternate spans, whichever produces the most unfavorable *load effect*. See Section 1607.13.2 for reductions in minimum roof live loads and Section 7.5 of ASCE 7 for partial snow loading. **1607.13.2 ~~General.~~ Reduction in uniform roof live loads.** The minimum uniformly distributed live loads of roofs and marquees, L_o, in Table 1607.1 are permitted to be reduced in accordance with Section 1607.13.2.1. **1607.13.2.1 Ordinary roofs, awnings and canopies.** Ordinary flat, pitched and curved roofs, and awnings and canopies other than of fabric construction supported by a skeleton structure, are permitted to be designed for a reduced uniformly distributed roof live load, L_r, as specified in the following equations or other controlling combinations of loads as specified in Section 1605, whichever produces the greater *load effect*. In structures such as greenhouses, where special scaffolding is used as a work surface for workers and materials during maintenance and repair operations, a lower roof load than specified in the following equations shall not be used unless *approved* by the *building official*. Such structures shall be designed for a minimum roof live load of 12 psf (0.58 kN/m^2). $L_r = L_o R_1 R_2$ **(Equation 16-26)** where: $0.58 \le L_r \le 0.96$ L_o = Unreduced roof live load per square foot (m^2) of horizontal projection supported by the member (see Table 1607.1). L_r = Reduced roof live load per square foot (m^2) of horizontal projection supported by the member.		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	where: $12 \le L_r \le 20$ For SI: $L_r = L_o R_1 R_2$ The reduction factors R_1 and R_2 shall be determined as follows: $R_1 = 1$ for $A_t \le 200$ square feet (18.58 m^2) **(Equation 16-27)** $R_1 = 1.2 - 0.001A_t$ for 200 square feet $< A_t <$ 600 square feet **(Equation 16-28)** For SI: $1.2 - 0.011A_t$ for 18.58 square meters $< A_t <$ 55.74 square meters $R_1 = 0.6$ for $A_t \ge 600$ square feet (55.74 m^2) **(Equation 16-29)** where: A_t = Tributary area (span length multiplied by effective width) in square feet (m^2) supported by the member, and $R_2 = 1$ for $F \le 4$ **(Equation 16-30)** $R_2 = 1.2 - 0.05F$ for $4 < F < 12$ **(Equation 16-31)** $R_2 = 0.6$ for $F \ge 12$ **(Equation 16-32)** where: F = For a sloped roof, the number of inches of rise per foot (for SI: F = 0.12 × slope, with slope expressed as a percentage), or for an arch or dome, the rise-to-span ratio multiplied by 32. ~~**1607.13.3**~~ **1607.13.2.2 Occupiable roofs.** Areas of roofs that are occupiable, such as *vegetative roofs*, roof gardens or for assembly or other similar purposes, and marquees are permitted to have their uniformly distributed live loads reduced in accordance with Section 1607.11.					

<table>
<tr><th colspan="6">Table 10. 2021 IBC STRUCTURAL Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IBC STRUCTURAL CHANGE SUMMARY</th><th colspan="3">IBC STRUCTURAL COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td><s>1607.13.3.1</s> 1607.13.3 Vegetative and landscaped roofs. The weight of all landscaping materials shall be considered as dead load and shall be computed on the basis of saturation of the soil as determined in accordance with Section 3.1.4 of ASCE 7. The uniform design live load in unoccupied landscaped areas on roofs shall be 20 psf (0.958 kN/m^2). The uniform design live load for occupied landscaped areas on roofs shall be determined in accordance with Table 1607.1.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>S72-19</td><td><s>1607.13.5.2.1</s> 1607.13.5.3 Photovoltaic panels installed on open grid roof structures. Structures with open grid framing and without a roof deck or sheathing supporting photovoltaic panel systems shall be designed to support the uniform and concentrated roof live loads specified in Section 1607.13.5.1, except that the uniform roof live load shall be permitted to be reduced to 12 psf (0.57 kN/m^2).

<s>1607.13.5.3</s> 1607.13.5.4 <s>Photovoltaic panels or modules installed as an independent structure.</s> Ground-mounted photovoltaic (PV) panel systems. <s>Solar photovoltaic panels or modules</s> Ground-mounted photovoltaic (PV) panel systems that are independent structures and do not have accessible/occupied space underneath are not required to accommodate a roof photovoltaic live load<s>, provided that the area under the structure is restricted to keep the public away</s>. Other loads and combinations in accordance with Section 1605 shall be accommodated. <s>Solar photovoltaic panels or modules that are designed to be the roof, span to structural supports and have accessible/occupied space underneath shall have the panels or modules and all supporting structures designed to support a roof photovoltaic live load, as defined in Section 1607.13.5.1 in combination with other applicable loads. Solar photovoltaic panels or modules in this application are not permitted to be classified as "not accessible" in accordance with Section 1607.13.5.1.</s>

<s>1607.13.5.4</s> 1607.13.5.5 Ballasted photovoltaic panel systems. Roof structures that provide support for ballasted photovoltaic panel systems shall be designed, or analyzed, in accordance with Section 1604.4; checked in accordance with Section 1604.3.6 for deflections; and checked in accordance with Section 1611 for ponding.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>S73-19</td><td>1607.14.2 Vertical impact force. The maximum wheel loads of the crane shall be increased by the following percentages to <s>determine</s> account for the <s>induced</s> effects of vertical impact or vibration <s>force</s>:

<table><tr><td>Monorail cranes (powered)</td><td>25 percent</td></tr><tr><td>Cab-operated or remotely operated bridge cranes (powered)</td><td>25 percent</td></tr></table></td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

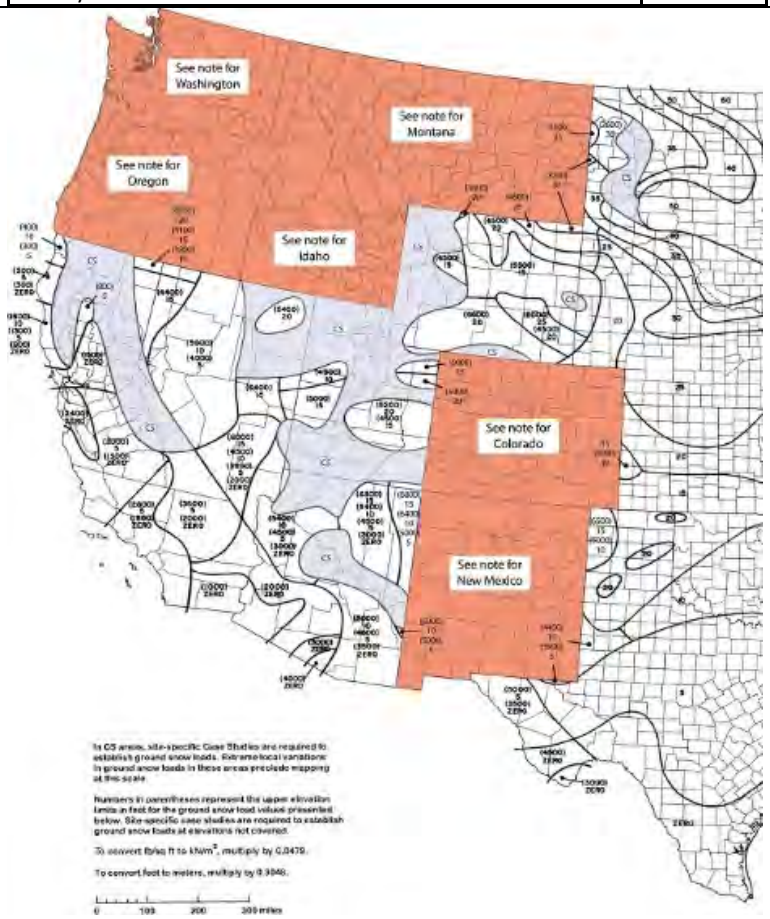
Table 10. 2021 IBC STRUCTURAL Changes Cost Impact							
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Pendant-operated bridge cranes (powered) — 10 percent Bridge cranes or monorail cranes with hand-geared bridge, trolley and hoist — 0 percent					
S74-19	 NOTE: See ASCE 7 Tables~~s~~ 7.2-2 for Colorado,~~; see~~ Table 7.2-3 for Idaho,~~; see~~ Table 7.2-4 for Montana,~~; see~~ Table 7.2-5 for Washington,~~; see~~ Table 7.2-6 for New Mexico,~~; see~~ Table 7.2-7 for Oregon, and~~; see~~ Table 7.2-8 for New Hampshire. **FIGURE 1608.2** **GROUND SNOW LOADS, p_g, FOR THE UNITED STATES (psf)**		X			Clarification
S76-19	**1610.2 Uplift loads on floor and foundations.** Basement floors, slabs on ground, foundations, and similar approximately horizontal elements below grade shall be designed to resist uplift loads where applicable. The upward pressure of water shall be taken as the full hydrostatic pressure applied over the entire area. The hydrostatic load shall be measured from the underside of the ~~construction~~ element			X	Minimal depending on design practice	Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	being evaluated. The design for upward loads caused by expansive soils shall comply with Section 1808.6.					
S77-19	**Revise as follows:** **1610.1 General.** Foundation walls and retaining walls shall be designed to resist lateral soil loads from adjacent soil. Soil loads specified in Table 1610.1 shall be used as the minimum design lateral soil loads unless determined otherwise by a geotechnical investigation in accordance with Section 1803. Foundation walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure. Retaining walls free to move and rotate at the top shall be permitted to be designed for active pressure. ~~Design lateral~~ Lateral pressure from surcharge loads shall be added to the lateral ~~earth pressure~~ soil load. ~~Design lateral~~ Lateral pressure shall be increased if expansive soils are present at the site ~~are expansive~~. Foundation walls shall be designed to support the weight of the full hydrostatic pressure of undrained backfill unless a drainage system is installed in accordance with Sections 1805.4.2 and 1805.4.3. **Exception:** Foundation walls extending not more than 8 feet (2438 mm) below grade and laterally supported at the top by flexible diaphragms shall be permitted to be designed for active pressure.		X			Clarification
S79-19	**1611.1 Design rain loads.** Each portion of a roof shall be designed to sustain the load of rainwater ~~that will accumulate on it if the primary drainage system for that portion is blocked plus the uniform load caused by water that rises above the inlet of the secondary drainage system at its design flow~~ as per the requirements of Chapter 8 of ASCE 7. The design rainfall shall be based on the 100-year ~~hourly rainfall rate indicated in Figure 1611.1~~ 15-minute duration event, or on other rainfall rates determined from *approved* local weather data. Alternatively, a design rainfall of twice the 100-year hourly rainfall rate indicated in Figure 1611.1 shall be permitted. $R = 5.2(d_s + d_h)$ **(Equation 16-35)** where: d_h = Additional depth of water on the undeflected roof above the inlet of secondary drainage system at its design flow (in other words, the hydraulic head), in inches (mm). d_s = Depth of water on the undeflected roof up to the inlet of secondary drainage system when the primary drainage system is blocked (in other words, the static head), in			X	Minimal	Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	inches (mm). *R* = Rain load on the undeflected roof, in psf (kN/m^2). Where the phrase "undeflected roof" is used, deflections from loads (including dead loads) shall not be considered when determining the amount of rain on the roof. For SI: $R = 0.0098(d_s + d_h)$ **1611.2 Ponding instability.** Susceptible bays of roofs shall be evaluated for ponding instability in accordance with ~~Section 8.4~~ Chapter 7 and Chapter 8 of ASCE 7.					
S80-19	**1612.4 Flood hazard documentation.** The following documentation shall be prepared and sealed by a *registered design professional* and submitted to the *building official*: 1. For construction in *flood hazard areas* other than *coastal high hazard areas* or *coastal A zones*: 1.1. The elevation of the lowest floor, including the basement, as required by the lowest floor elevation inspection in Section 110.3.3 and for the final inspection in Section 110.3.11.1. 1.2. For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.7.2.1 of ASCE 24, *construction documents* shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.7.2.2 of ASCE 24. 1.3. For dry floodproofed nonresidential buildings, *construction documents* shall include a statement that the dry floodproofing is designed in accordance with ASCE 24 and shall include the flood emergency plan specified in Chapter 6 of ASCE 24. 2. For construction in *coastal high hazard areas* and *coastal A zones*: 2.1. The elevation of the bottom of the lowest horizontal structural member as required by the lowest floor elevation inspection in Section 110.3.3 and for the final inspection in Section 110.3.11.1. 2.2. *Construction documents* shall include a statement that the building is designed in accordance with ASCE 24, including that the pile or column foundation and building or structure to be attached thereto is designed to be anchored to resist flotation, collapse and lateral movement due to the effects		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	of wind and flood loads acting simultaneously on all building components, and other load requirements of Chapter 16. 2.3. For breakaway walls designed to have a resistance of more than 20 psf (0.96 kN/m^2) determined using *allowable stress design*, *construction documents* shall include a statement that the breakaway wall is designed in accordance with ASCE 24.					
S81-19	**1612.4 Flood hazard documentation.** The following documentation shall be prepared and sealed by a *registered design professional* and submitted to the *building official*: 1. For construction in flood hazard areas other than coastal high hazard areas or coastal A zones: 1.1. The elevation of the lowest floor, including the basement, as required by the lowest floor elevation inspection in Section 110.3.3 and for the final inspection in Section 110.3.11.1. 1.2. For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.7.2.1 of ASCE 24, construction documents shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.7.2.2 of ASCE 24. 1.3. For dry floodproofed nonresidential buildings, construction documents shall include a statement that the dry floodproofing is designed in accordance with ASCE 24. 2. For construction in coastal high hazard areas and coastal A zones: 2.1. The elevation of the bottom of the lowest horizontal structural member as required by the lowest floor elevation inspection in Section 110.3.3 and for the final inspection in Section 110.3.11.1. 2.2. Construction documents shall include a statement that the building is designed in accordance with ASCE 24, including that the pile or column foundation and building or structure to be attached thereto is designed to be anchored to resist flotation, collapse and lateral movement due to the effects of wind and flood loads acting simultaneously on all building components, and other load requirements of Chapter 16. 2.3. For breakaway walls designed to have a resistance of more than 20 psf (0.96 kN/m2) determined using allowable stress design, construction documents shall include a statement that the breakaway wall is designed in accordance with ASCE 24.		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	2.4. For breakaway walls where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.7.2.1 of ASCE 24, construction documents shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.7.2.2 of ASCE 24.					
S90-19	**[Reserved under FBC]** **1704.6 Structural observations.** Where required by the provisions of Section 1704.6.1, 1704.6.2 or 1704.6.3, the owner or the owner's authorized agent shall employ a *registered design professional* to perform structural observations. The structural observer shall visually observe representative locations of structural systems, details, and load paths for general conformance to ~~the design intent as defined in~~ the approved construction documents. Structural observation does not include or waive the responsibility for the inspections in Section 110 or the *special inspections* in Section 1705 or other sections of this code. Prior to the commencement of observations, the structural observer shall submit to the *building official* a written statement identifying the frequency and extent of structural observations. At the conclusion of the work included in the permit, the structural observer shall submit to the *building official* a written statement that the site visits have been made and identify any reported deficiencies that, to the best of the structural observer's knowledge, have not been resolved.		X			Clarification
S92-19	**[Reserved under FBC]** **1704.6.1 Structural observations for structures.** Structural observations shall be provided for those structures where one or more of the following conditions exist: 1. The structure is classified as Risk Category III or IV. 2. The structure is a high-rise building. 3. The structure is assigned to Seismic Design Category E, and is greater than two stories above the grade plane. ~~3.~~4. Such observation is required by the registered design professional responsible for the structural design. ~~4.~~5. Such observation is specifically required by the building official.		X			Clarification

<table>
<tr><th colspan="7">Table 10. 2021 IBC STRUCTURAL Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IBC STRUCTURAL CHANGE SUMMARY</th><th colspan="3">IBC STRUCTURAL COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td><s>1704.6.2 Structural observations for seismic resistance.</s> <s>Structural observations shall be provided for those structures assigned to Seismic Design Category D, E or F where one or more of the following conditions exist:</s>

<s>1. The structure is classified as Risk Category III or IV.</s>
<s>2. The structure is assigned to Seismic Design Category E, is classified as Risk Category I or II, and is greater than two stories above the grade plane.</s>

<s>1704.6.3 Structural observations for wind resistance.</s> <s>Structural observations shall be provided for those structures sited where V is 130 mph (58 m/sec) or greater and the structure is classified as Risk Category III or IV.</s></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>S97-19</td><td>[Reserved under FBC]
TABLE 1705.3
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION</td><td></td><td></td><td>X</td><td>Minimal</td><td>Incorporates ACI 550.5 standard for safety</td></tr>
<tr><td>S99-19</td><td>[Reserved under FBC]
1705.4.1 <s>Empirically designed masonry, glass</s> Glass unit masonry and masonry veneer in Risk Category IV. Special inspections and tests for <s>empirically designed masonry,</s> glass unit masonry or masonry veneer designed in accordance with Section <s>2109,</s> 2110 or Chapter 14, respectively, where they are part of a structure classified as Risk Category IV shall be performed in accordance with TMS 402, Level B Quality Assurance.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>S100-19</td><td>[Reserved under FBC]
<u>1705.5.3 Mass timber construction.</u> Special inspections <u>of Mass Timber elements in Types IV-A, IV-B and IV-C construction shall be in accordance with Table 1705.5.3.</u>

<u>TABLE 1705.5.3</u>
<u>REQUIRED SPECIAL INSPECTIONS OF MASS TIMBER CONSTRUCTION</u>

<table>
<tr><th>Type</th><th>Continuous Special Inspection</th><th>Periodic Special Inspection</th></tr>
<tr><td><u>1. Inspection of anchorage and connections of mass timber construction to timber deep foundation systems.</u></td><td>-</td><td><u>X</u></td></tr>
<tr><td><u>2. Inspect erection of mass timber construction</u></td><td>-</td><td><u>X</u></td></tr>
<tr><td><u>3. Inspection of connections where installation methods are required to meet design loads</u></td><td>-</td><td>-</td></tr>
<tr><td><u>3.1. Threaded fasteners</u></td><td>-</td><td>-</td></tr>
<tr><td><u>3.1.1. Verify use of proper installation equipment.</u></td><td>-</td><td><u>X</u></td></tr>
<tr><td><u>3.1.2. Verify use of pre-drilled holes where required.</u></td><td>-</td><td><u>X</u></td></tr>
</table></td><td></td><td></td><td>X</td><td>Minimal (0.15-0.30%) special inspection required for new construction type</td><td>Necessary addition for clarification for new construction type</td></tr>
</table>

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CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	3.1.3. Inspect screws, including diameter, length, head type, spacing, installation angle, and depth. — X 3.2. Adhesive anchors installed in horizontal or upwardly inclined orientation to resist sustained tension loads — X 3.3. Adhesive anchors not defined in 3.2. — X 3.4. Bolted connections — X 3.5. Concealed connections — X					
S102-19	**[Reserved under FBC]** **1705.6 Soils.** *Special inspections* and tests of existing site soil conditions, fill placement and load-bearing requirements shall be performed in accordance with this section and Table 1705.6. The *approved* geotechnical report and the *construction documents* prepared by the *registered design professionals* shall be used to determine compliance. ~~During fill placement, the special inspector shall verify that proper materials and procedures are used in accordance with the provisions of the *approved* geotechnical report.~~ **Exception:** Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that the in-place dry density of the compacted fill is not less than 90 percent of the maximum dry density at optimum moisture content determined in accordance with ASTM D1557. **TABLE 1705.6** **REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS** TYPE / CONTINUOUS SPECIAL INSPECTION / PERIODIC SPECIAL INSPECTION 1.Verify materials below shallow foundations are adequate to achieve the design bearing capacity. — X 2.Verify excavations are extended to proper depth and have reached proper material. — X 3.Perform classification and testing of compacted fill materials. — X 4.During fill placement, verify use of proper materials and procedures in accordance with the provisions of the *approved* geotechnical report. Verify densities and lift thicknesses during placement and com-paction of compacted fill. X — 5.Prior to placement of compacted fill, inspect subgrade and verify that site has been pre-pared properly. — X **TABLE 1705.7** **REQUIRED SPECIAL INSPECTIONS AND TESTS OF DRIVEN DEEP**		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IBC STRUCTURAL CHANGE SUMMARY</th><th colspan="3">IBC STRUCTURAL COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>
FOUNDATION ELEMENTS
<table>
<tr><th>TYPE</th><th>CONTINUOUS SPECIAL INSPECTION</th><th>PERIODIC SPECIAL INSPECTION</th></tr>
<tr><td>1.Verify element materials, sizes and lengths comply with the requirements.</td><td>X</td><td>—</td></tr>
<tr><td>2.Determine capacities of test elements and conduct additional load tests, as required.</td><td>X</td><td>—</td></tr>
<tr><td>3.Inspect driving operations and maintain complete and accurate records for each element.</td><td>X</td><td>—</td></tr>
<tr><td>4.Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element.</td><td>X</td><td>—</td></tr>
<tr><td>5.For steel elements, perform additional special inspections in accordance with Section 1705.2.</td><td>In accordance with 1705.2</td><td></td></tr>
<tr><td>6.For concrete elements and concrete-filled elements, perform tests and additional special inspections in accordance with Section 1705.3.</td><td>In accordance with 1705.3</td><td></td></tr>
<tr><td>7.For specialty elements, perform additional inspections as defined in the statement of special inspections.</td><td>In accordance with Statement of Special Inspections</td><td></td></tr>
</table>
TABLE 1705.8
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS
<table>
<tr><th>TYPE</th><th>CONTINUOUS SPECIAL INSPECTION</th><th>PERIODIC SPECIAL INSPECTION</th></tr>
<tr><td>1.Inspect drilling operations and maintain complete and accurate records for each element.</td><td>X</td><td>—</td></tr>
<tr><td>2.Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes.</td><td>X</td><td>—</td></tr>
<tr><td>3.For concrete elements, perform tests and additional special inspections in accordance with Section 1705.3.</td><td>In accordance with 1705.3</td><td></td></tr>
</table>
</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>S103-19</td><td>[Reserved under FBC]
1705.10 Structural Integrity of Deep Foundation Elements. ~~When directed by the registered design professional in responsible charge or by the building official,~~ Whenever there is a reasonable doubt as to the structural integrity of a deep foundation element, an engineering</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	assessment shall be required. ~~for structural integrity shall be conducted a deep foundation element~~. The engineering assessment shall include tests for defects performed in accordance with ASTM D4945, ASTM D5882, ASTM D6760, or ASTM D7949 or other *approved* method.					
S104-19	**[Reserved under FBC]** **1705.11 Special inspections for wind resistance.** *Special inspections* for wind resistance specified in Sections 1705.11.1 through 1705.11.3, unless exempted by the exceptions to Section 1704.2, are required for buildings and structures constructed in the following areas: 1. In wind Exposure Category B, where V_{asd} ~~as determined in accordance with Section 1609.3.1 is 120~~ is 150 miles per hour (~~52.8~~ 67 m/sec) or greater. 2. In wind Exposure Category C or D, where V_{asd} ~~as determined in accordance with Section 1609.3.1 is 110~~ is 140 mph (~~49~~ 62.6 m/sec) or greater.		X			Clarification
S105-19	**[Reserved under FBC]** **1705.12.2 Structural wood.** For the *seismic force-resisting systems* of structures assigned to *Seismic Design Category* C, D, E or F: 1. *Continuous special inspection* shall be required during field gluing operations of elements of the seismic force-resisting system. 2. *Periodic special inspection* shall be required for nailing, bolting, anchoring and other fastening of elements of the seismic force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and hold-downs. **Exception:** *Special inspections* are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the seismic force-resisting system, where the lateral resistance is provided by structural sheathing, and the specified fastener spacing at the panel edges is more than 4 inches (102 mm) on center.		X			Clarification
S107-19	**[Reserved under FBC]** **1705.12.7 Storage racks.** ~~If required by the Engineer of Record~~ Sstorage racks, that are 8 feet in height or greater and assigned to Seismic Design Category D, E, or F, shall be provided with *periodic special inspection* as required by ~~inspected by an inspector designated by the Engineer of Record as detailed in~~ Table			X	NA	Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	1705.12.7. ~~for adherence with the approved construction documents.~~ **TABLE 1705.12.7** **REQUIRED INSPECTIONS OF STORAGE RACK SYSTEMS** **2209.3 Certification.** For rack s~~S~~torage s~~S~~tructures that are 8 feet in height or greater to the top load level and assigned to Seismic Design Category D, E, or F~~, if required by the Engineer of Record,~~ at completion of the storage rack installation, ~~the Engineer of Record shall submit~~ a *certificate of compliance* shall be submitted to the owner or the owner's authorized agent stating that the work was performed in accordance with *approved construction documents* ~~and with specifications listed in this section~~. ~~MH16.1: 2012: Specification for the Design, Testing and Utilization of Industrial Steel Storage Racks~~					
S108-19	**1709.5 Exterior window and door assemblies.** The design pressure rating of exterior windows and doors in buildings shall be determined in accordance with Section 1709.5.1 or 1709.5.2. For exterior windows and doors tested in accordance with Sections 1709.5.1 or 1709.5.2, required design wind pressures determined from ASCE 7 shall be permitted to be converted to allowable stress design by multiplying by 0.6. **Exception:** Structural wind load design pressures for window ~~units smaller~~ or door assemblies other than the size tested in accordance with Section 1709.5.1 or 1709.5.2 shall be permitted to be ~~higher~~ different than the design value of the tested ~~unit~~ assembly provided such ~~higher~~ pressures are determined by accepted engineering ~~analysis.~~ analysis or validated by an additional test of the window or door assembly to the alternative allowable design pressure in accordance with Section 1709.5.2. Components of the ~~small unit~~ alternate size assembly shall be the same as the tested ~~unit. Where such calculated design pressures are~~ or labeled assembly. Where engineering analysis is used, ~~they~~ it shall be ~~validated by an additional test of the window unit having the highest allowable design pressure~~.performed in accordance with the analysis procedures of AAMA 2502.		X			Provides convenient way to validate exterior windows and doors wind test results based on existing test results
S109-19	**1709.5.2 Exterior windows and door assemblies not provided for in Section 1709.5.1.** Exterior window and door assemblies shall be tested in accordance with ASTM E330. Exterior window and door assemblies containing glass shall comply with Section 2403. The design pressure for testing shall be calculated in accordance with			X	Minimal	Clarification

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CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Chapter 16. Each assembly shall be tested for 10 seconds at a load equal to 1.5 times the design pressure. **1709.5.2.1 Garage doors and rolling doors.** Garage doors and rolling doors shall be tested in accordance with either ASTM E 330 or ANSI/DASMA 108, and shall meet the ~~acceptance~~ pass/fail criteria of ANSI/DASMA 108. Garage doors and rolling doors shall ~~have~~ be *labeled* with a permanent *label* ~~label~~ identifying the door manufacturer, the door model/series number, the positive and negative design wind pressure rating, the installation instruction drawing reference number, and the applicable test standard.					
S110-19	**1709.5.3 Wind-borne debris protection.** Protection of exterior glazed openings in buildings located in windborne debris regions shall be in accordance with Section 1609.~~1.~~2. **1709.5.3.1 Impact protective systems testing and labeling.** Impact protective systems shall be tested for impact resistance by an approved independent laboratory for compliance with ASTM E 1886 and ASTM E 1996 and~~. Impact protective systems shall also be tested~~ for design wind pressure ~~by an approved independent laboratory~~ for compliance with ASTM E 330. Required design wind pressures shall be determined in accordance with ~~Section 1609.6 or~~ ASCE 7, and for the purposes of this section, multiplied by 0.6 to convert to allowable stress design. Impact protective systems shall have a permanent label applied in accordance with Section 1703.5.4 identifying the manufacturer ,product designation, performance characteristics, and approved inspection agency.~~ Impact protective systems shall have a permanent label applied in accordance with Section 1703.5.4 that provides traceability to the manufacturer, product designation, and performance characteristics.~~			X	Minimal ($0.05-0.15/label)	Clarification
S111-19	**1803.5.7 Excavation near foundations.** Where excavation will reduce support from any foundation, a *registered design professional* shall prepare an assessment of the structure as determined from examination of the structure, ~~the review of~~ available design documents, available subsurface data, and, if necessary, excavation of test pits. The *registered design professional* shall determine the requirements for ~~underpinning~~ support and protection of any existing foundation and prepare site-specific plans, details and sequence of work for submission. Such support shall be provided by underpinning, ~~sheeting and~~ bracing, excavation retention systems, or by other means acceptable to the *building official*.		X			Clarification

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Sub Code:						
S112-19	**1804.1 Excavation near foundations.** Excavation for any purpose shall not reduce vertical or lateral support for any foundation or adjacent foundation without first underpinning or protecting the foundation against detrimental lateral or vertical movement, or both, in accordance with Section 1803.5.7.		X			Clarification
S115-19	**1807.2.4 Segmental Retaining Walls.** Dry-cast concrete units used in the construction of segmental retaining walls shall comply with ASTM C1372.		X			Necessary addition for clarification
S117-19	**1808.8.1 Concrete or grout strength and mix proportioning.** Concrete or grout in foundations shall have a specified compressive strength (f'_c) not less than the largest applicable value indicated in Table 1808.8.1. Where concrete ~~is placed through a funnel hopper at the top of a deep foundation element, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than 8 inches (204 mm). Where concrete~~ or grout is to be pumped, the mix design including slump shall be adjusted to produce a pumpable mixture.		X			Clarification
S122-19	**1809.5.1 Frost Protection at Required Exits.** Frost protection shall be provided at exterior landings for all required exits with outward swinging doors. Frost protection shall only be required to the extent necessary to ensure the unobstructed opening of the required exit doors. ~~**Exception:** Landings that serve exits which do not have outward swinging doors.~~			X	Minimal	Clarification
S124-19	**TABLE 1810.3.2.6** **ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS** *Portions of table not shown remain unchanged.* **MATERIAL TYPE AND CONDITION** / **MAXIMUM ALLOWABLE STRESS[a]** 1. Concrete or grout in compression[b] Cast-in-place with a permanent casing in accordance with Section 1810.3.2.7 or Section 1810.3.5.3.4 — $0.4 f'_c$ Cast-in-place in ~~a pipe, tube,~~ other permanent casing or rock — $0.33 f'_c$ Cast-in-place without a permanent casing — $0.3 f'_c$ Precast nonprestressed — $0.33 f'_c$ Precast prestressed — $0.33 f'_c - 0.27 f_{pc}$ a. f'_c is the specified compressive strength of the concrete or grout; f_{pc} is the compressive stress on the gross concrete	X			Minimal	Clarification

<table>
<tr><th colspan="7">Table 10. 2021 IBC STRUCTURAL Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IBC STRUCTURAL CHANGE SUMMARY</th><th colspan="3">IBC STRUCTURAL COST IMPACT</th><th>ESTIMATED AMOUNT*</th><th>BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th><th></th><th></th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>section due to effective prestress forces only; fy is the specified yield strength of reinforcement; Fy is the specified minimum yield stress of steel; Fu is the specified minimum tensile stress of structural steel.
b. The stresses specified apply to the gross cross-sectional area within the concrete surface. Where a temporary or permanent casing is used, the inside face of the casing shall be considered to be the concrete surface.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>S125-19</td><td>TABLE 1810.3.2.6
ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS

Portions of table not shown remain unchanged.
<table><tr><th>MATERIAL TYPE AND CONDITION</th><th>MAXIMUM ALLOWABLE STRESS[a]</th></tr><tr><td>3. Steel in compression
Cores within concrete-filled pipes or tubes
Pipes, tubes or H-piles, where justified in accordance with Section 1810.3.2.8
Pipes or tubes for micropiles
Other pipes, tubes or H-piles
Helical piles</td><td>
0.5 $F_y \le 32{,}000$ psi

0.5 $F_y \le 32{,}000$ psi
0.4 $F_y \le 32{,}000$ psi
0.35 $F_y \le$ ~~16,000~~
<u>24,000</u> psi
0.6 $F_y \le 0.5\ F_u$</td></tr><tr><td>5. Steel in tension
Pipes, tubes or H-piles, where justified in accordance with Section 1810.3.2.8
Other pipes, tubes or H-piles
Helical piles</td><td>

$0.5F_y \le 32{,}000$ psi
0.35 $F_y \le$ ~~16,000~~
24,000 psi
0.6 $F_y \le 0.5\ F_u$</td></tr></table>a. f ’ c is the specified compressive strength of the concrete or grout; fpcis the compressive stress on the gross concrete section due to effective prestress forces only; fy is the specified yield strength of reinforcement; Fy is the specified minimum yield stress of steel; Fu is the specified minimum tensile stress of structural steel.
b. The stresses specified apply to the gross cross-sectional area within the concrete surface. Where a temporary or permanent casing is used, the inside face of the casing shall be considered to be the concrete surface.</td><td>X</td><td></td><td></td><td>Minimal</td><td>Clarification</td></tr>
<tr><td>S126-19</td><td>TABLE 1810.3.2.6
ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS</td><td>X</td><td></td><td></td><td>Minimal</td><td>Clarification</td></tr>
</table>

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Portions of table not shown remain unchanged. **MATERIAL TYPE AND CONDITION** / **MAXIMUM ALLOWABLE STRESS[a]** 4. Nonprestressed reinforcement in tension: $0.6 f_y$ Within micropiles Other conditions: $0.5 f_y \leq$ ~~24,000~~ 30,000 psi For load combinations that do not include wind or seismic loads For load combinations that include wind or seismic loads: $0.5 f_y \leq 40{,}000$ psi a. f ′ c is the specified compressive strength of the concrete or grout; fpcis the compressive stress on the gross concrete section due to effective prestress forces only; fy is the specified yield strength of reinforcement; Fy is the specified minimum yield stress of steel; Fu is the specified minimum tensile stress of structural steel. b. The stresses specified apply to the gross cross-sectional area within the concrete surface. Where a temporary or permanent casing is used, the inside face of the casing shall be considered to be the concrete surface.					
127-19	**1810.3.2.6 Allowable stresses.** The allowable stresses for materials used in deep foundation elements shall not exceed those specified in Table 1810.3.2.6. **TABLE 1810.3.2.6** **ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS** a. f ′ c is the specified compressive strength of the concrete or grout; fpcis the compressive stress on the gross concrete section due to effective prestress forces only; fy is the specified yield strength of reinforcement; Fy is the specified minimum yield stress of steel; Fu is the specified minimum tensile stress of structural steel. b. The stresses specified apply to the gross cross-sectional area ~~within~~ of the concrete ~~surface~~ for precast prestressed piles and to the net cross-sectional area for all other piles. Where a temporary or permanent casing is used, the inside face of the casing shall be considered ~~to be~~ the outer edge of the concrete ~~surface~~ cross-section.		X			Clarification
S129-19	**1810.3.3.1 Allowable axial load.** The allowable axial load on a deep foundation element shall be determined in accordance with Sections 1810.3.3.1.1 through 1810.3.3.1.9.	X			Minimal	Clarification

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CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
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Sub Code:						
	Exception: ~~Load testing is not required where~~ Where approved by the building official, load testing is not required.					
S130-19	**1810.3.3.1.9 Helical piles.** The allowable axial design load, P_a, of helical piles shall be determined as follows: $P_a = 0.5\,P_u$ **(Equation 18-4)** where P_u is the least value of: ~~1.~~ Base capacity plus shaft resistance of the helical pile. The base capacity is equal to the sum of the areas of the helical bearing plates times the ultimate bearing capacity of the soil or rock comprising the bearing stratum. The shaft resistance is equal to ~~only~~ the area of the shaft above the uppermost helical bearing plate times the ultimate skin resistance ~~shall be considered.~~ 2. Ultimate capacity determined from well-documented correlations with installation torque. 3. Ultimate capacity determined from load tests when required by Section 1810.3.3.1.2. 4. Ultimate axial capacity of pile shaft. 5. Ultimate axial capacity of pile shaft couplings. 6. Sum of the ultimate axial capacity of helical bearing plates affixed to pile.	X			Minimal	Clarification
S131-19	**1810.3.4 Subsiding soils or strata.** Where deep foundation elements are installed through subsiding ~~fills~~ soils or other subsiding strata and derive support from underlying firmer materials, consideration shall be given to the downward frictional forces potentially imposed on the elements by the subsiding upper strata. Where the influence of subsiding ~~fills~~ soils or strata is considered as imposing loads on the element, the allowable stresses specified in this chapter shall be permitted to be increased where satisfactory substantiating data are submitted.		X			Clarification
S132-19	**1810.3.11.2 Seismic Design Categories D through F.** For structures assigned to *Seismic Design Category* D, E or F, deep foundation element resistance to uplift forces or rotational restraint shall be provided by anchorage into the pile cap, designed considering the combined effect of axial forces due to uplift and bending moments due to fixity to the pile cap. Anchorage shall develop not less than 25 percent of the strength of the element in tension. Anchorage into the pile cap shall comply with the following:		X			Clarification

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CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	In the case of uplift, the anchorage shall be capable of developing the least of the following: 1. In the case of uplift, the anchorage shall be capable of developing the least of the following: 1.1. The nominal tensile strength of the longitudinal reinforcement in a concrete element. 1.2. The nominal tensile strength of a steel element. 1.3. The frictional force developed between the element and the soil multiplied by 1.3. **Exception:** The anchorage is permitted to be designed to resist the axial tension force resulting from the seismic load effects including overstrength factor in accordance with Section 2.3.6 or 2.4.5 of ASCE 7. 2. In the case of rotational restraint, the anchorage shall be designed to resist the axial and shear forces, and moments resulting from the seismic load effects including overstrength factor in accordance with Section 2.3.6 or 2.4.5 of ASCE 7 or the anchorage shall be capable of developing the full axial, bending and shear nominal strength of the element. 3. The connection between the pile cap and the steel H-piles or unfilled steel pipe piles in structures assigned to Seismic Design Category D, E, or F shall be designed for a tensile force of not less than 10 percent of the pile compression capacity. ~~**Exception**~~ **Exceptions:** 1. Connection tensile capacity need not exceed the strength required to resist seismic load effects including overstrength of ASCE 7 Section 12.4.3 or 12.14.3.2. 2. Connections need not be provided where the foundation or supported structure does not rely on the tensile capacity of the piles for stability under the design seismic force. Where the vertical lateral-force-resisting elements are columns, the pile cap flexural strengths shall exceed the column flexural strength. The connection between batter piles and pile caps shall be designed to resist the nominal strength of the pile acting as a short column. Batter piles and their connection shall be designed to resist forces and moments that result from the application of seismic load effects including overstrength factor in accordance with Section 2.3.6 or 2.4.5 of ASCE 7.					

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Sub Code:						
S133-19	**1810.3.6 Splices.** Splices shall be constructed so as to provide and maintain true alignment and position of the component parts of the deep foundation element during installation and subsequent thereto and shall be designed to resist the axial and shear forces and moments occurring at the location of the splice during driving and for design load combinations. Where deep foundation elements of the same type are being spliced, splices shall develop not less than 50 percent of the bending strength of the weaker section. Where deep foundation elements of different materials or different types are being spliced, splices shall develop the full compressive strength and not less than 50 percent of the tension and bending strength of the weaker section. Where structural steel cores are to be spliced, the ends shall be milled or ground to provide full contact and shall be full-depth welded. ~~**Exception:** Splices conforming to generally accepted engineering practices where approved by the *building official* for buildings assigned to Seismic Design Category A or B.~~ **Exception:** For buildings assigned to Seismic Design Category A or B, splices need not comply with the 50 percent tension and bending strength requirements where justified by supporting data. Splices occurring in the upper 10 feet (3048 mm) of the embedded portion of an element shall be designed to resist at allowable stresses the moment and shear that would result from an assumed eccentricity of the axial load of 3 inches (76 mm), or the element shall be braced in accordance with Section 1810.2.2 to other deep foundation elements that do not have splices in the upper 10 feet (3048 mm) of embedment.	X			Minimal	Clarification
S134-19	**1810.3.8 Precast concrete piles.** Precast concrete piles shall be designed and detailed in accordance with ACI 318. **Exceptions:** 1. For ~~Or~~ precast prestressed piles in Seismic Design Category C, the minimum ~~spiral reinforcement~~ volumetric ratio of spirals or circular hoops required by Section 18.13.5.10.4 of ACI 318 shall not apply in cases where the design includes full consideration of load combinations specified in ASCE 7, Section 2.3.6 or Section 2.4.5 and the applicable overstrength ~~a~~ factor, Ω_0. In such cases, minimum ~~spiral~~ transverse reinforcement index shall be as specified in Section 13.4.5.6 of ACI 318.		X			Clarification

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	2. For precast prestressed piles in Seismic Design Categories D through F, the minimum ~~spiral reinforcement~~ volumetric ratio of spirals or circular hoops required by Section 18.13.5.10.5(c) of ACI 318 shall not apply in cases where the design includes full consideration of load combinations specified in ASCE 7, Section 2.3.6 or Section 2.4.5 and the applicable overstrength factor, Ω_0. In such cases, minimum ~~spiral~~ transverse reinforcement shall be as specified in Section 13.4.5.6 of ACI 318.					
S135-19	**1810.3.11.1 Seismic Design Categories C through F.** For structures assigned to *Seismic Design Category* C, D, E or F, concrete deep foundation elements shall be connected to the pile cap in accordance with ACI 318. For resistance to uplift forces, anchorage of steel pipes, tubes or H-piles to the pile cap shall be made by means other than concrete bond to the bare steel section. Concrete-filled steel pipes or tubes shall have reinforcement of not less than 0.01 times the cross-sectional area of the concrete fill developed into the cap and extending into the fill a length equal to two times the required cap embedment, but not less than the development length in tension of the reinforcement. ~~**1810.3.11.1**~~ **1810.3.11.2 Seismic Design Categories D through F.** For structures assigned to *Seismic Design Category* D, E or F, deep foundation element resistance to uplift forces or rotational restraint shall be provided by anchorage into the pile cap, designed considering the combined effect of axial forces due to uplift and bending moments due to fixity to the pile cap. Anchorage shall develop not less than 25 percent of the strength of the element in tension. Anchorage into the pile cap shall comply with the following: 1. In the case of uplift, the anchorage shall be capable of developing the least of the following: 1.1. The nominal tensile strength of the longitudinal reinforcement in a concrete element. 1.2. The nominal tensile strength of a steel element. 1.3. The frictional force developed between the element and the soil multiplied by 1.3. **Exception:** The anchorage is permitted to be designed to resist the axial tension force resulting from the seismic load effects including overstrength factor in accordance with Section 2.3.6 or 2.4.5 of ASCE 7.		X			Clarification

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		Decrease	None	Increase		
Sub Code:						
	2. In the case of rotational restraint, the anchorage shall be designed to resist the axial and shear forces, and moments resulting from the seismic load effects including overstrength factor in accordance with Section 2.3.6 or 2.4.5 of ASCE 7 or the anchorage shall be capable of developing the full axial, bending and shear nominal strength of the element. Where the vertical lateral-force-resisting elements are columns, the pile cap flexural strengths shall exceed the column flexural strength. The connection between batter piles and pile caps shall be designed to resist the nominal strength of the pile acting as a short column. Batter piles and their connection shall be designed to resist forces and moments that result from the application of seismic load effects including overstrength factor in accordance with Section 2.3.6 or 2.4.5 of ASCE 7.					
S136-19	**1810.3.12 Grade beams.** ~~For structures assigned to *Seismic Design Category* D, E or F, grade~~ Grade beams shall comply with the provisions ~~in Section 18.13.3~~ of ACI 318 ~~for grade beams, except where they are~~. **Exception:** Grade beams designed to resist the seismic load effects including overstrength factor in accordance with Section 2.3.6 or 2.4.5 of ASCE 7. **1810.3.13 Seismic ties.** ~~For structures assigned to Seismic Design Category C, D, E or F, individual deep foundations shall be interconnected by ties. Unless it can be demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade or confinement by competent rock, hard cohesive soils or very dense granular soils, ties shall be capable of carrying, in tension or compression, a force equal to the lesser of the product of the larger pile cap or column design gravity load times the seismic coefficient, SDS, divided by 10, and 25 percent of the smaller pile or column design gravity load.~~ Seismic ties shall comply with the provisions of ACI 318. **Exception:** In Group R-3 and U occupancies of light-frame construction, deep foundation elements supporting foundation walls, isolated interior posts detailed so the element is not subject to lateral loads or exterior decks and patios are not subject to interconnection where the soils are of adequate stiffness, subject to the approval of the *building official*.		X			Clarification

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Sub Code:						
S137-19	**1810.4.1.2 Shafts in unstable soils.** Where cast-in-place deep foundation elements are formed through unstable soils, the open hole shall be stabilized by a casing, ~~suitable~~ slurry, or other *approved* method prior to placing the concrete. Where the casing is withdrawn during concreting, the level of concrete shall be maintained above the bottom of the casing at a sufficient height to offset any hydrostatic or lateral soil pressure. Driven casings shall be mandrel driven their full length in contact with the surrounding soil.	X			Minimal	Clarification
S138-19	**1810.4.1.3 Driving near uncased concrete.** Deep foundation elements shall not be driven within six element diameters center to center in granular soils or within one-half the element length in cohesive soils of an uncased element filled with concrete less than 48 hours old unless *approved* by the *building official*. ~~During~~ If driving near uncased concrete elements~~,~~ causes ~~if~~ the concrete surface in any completed element to rise~~s~~ or drop~~s~~ significantly or bleed~~s~~ additional water, the ~~previously~~ completed element shall be replaced. Driven uncased deep foundation elements shall not be installed in soils that could cause heave.		X			Clarification
S139-19	**1810.4.1.3 Driving near uncased concrete.** Deep foundation elements shall not be driven within six element diameters center to center in granular soils or within one-half the element length in cohesive soils of an uncased element filled with concrete less than 48 hours old unless *approved* by the *building official*. If the concrete surface in any completed element rises or drops, the element shall be replaced. ~~Driven uncased deep foundation elements shall not be installed in soils that could cause heave.~~		X			Clarification
S140-19	**1810.4.5 Vibratory driving.** Vibratory drivers shall only be used to install deep foundation elements where the element load capacity is verified by load tests in accordance with Section 1810.3.3.1.2. The installation of production elements shall be controlled according to power consumption, rate of penetration or other *approved* means that ensure element capacities equal or exceed those of the test elements. **Exceptions:** 1. The pile installation is completed by driving with an impact hammer in accordance with Section 1810.3.3.1.1. 2. The pile is to be used only for lateral resistance.	X			Minimal	Clarification
S141-19	**1810.4.11 Helical piles.** Helical piles shall be installed to specified embedment depth and torsional resistance criteria as determined by a *registered design professional*. The torque applied during installation shall not exceed the manufacturer's rated maximum ~~allowable~~ installation torque resistance of the helical pile.		X			Clarification

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		Decrease	None	Increase		
Sub Code:						
S143-19	**1901.2 Plain and reinforced concrete.** Structural concrete shall be designed and constructed in accordance with the requirements of this chapter and ACI 318 as amended in Section 1905 of this code. Except for the provisions of Sections 1904 and 1907, the design and construction of slabs on grade shall not be governed by this chapter unless they transmit vertical loads or lateral forces from other parts of the structure to the soil. ~~Precast concrete diaphragms in buildings assigned to *Seismic Design Category* C, D, E or F shall be designed in accordance with the requirements of ASCE 7, Section 14.2.4.~~		X			Clarification
S145-19	**Modify proposal as follows:** **1901.3 Anchoring to concrete.** Anchoring to concrete shall be in accordance with ACI 318 as amended in Section 1905, and applies to cast-in (headed bolts, headed studs and hooked J- or L-bolts)~~;~~, post-installed expansion (torque-controlled and displacement-controlled)~~;~~, undercut, screw, and adhesive~~; and screw~~ anchors.		X			Clarification
S147-19	**1901.7 Tolerances for structural concrete.** Where not indicated in construction documents, structural tolerances for concrete structural elements shall be in accordance with this section. **1901.7.1 Cast-in-place concrete tolerances.** Structural tolerances for cast-in-place concrete structural elements shall be in accordance with ACI 117. **Exceptions:** 1. Group R-3 detached one or two-family dwellings are not required to comply with this section 2. Shotcrete is not required to comply with this section **1901.7.2 Precast concrete tolerances.** Structural tolerances for precast concrete structural elements shall be in accordance with ACI ITG-7. **Exception:** Group R-3 detached one or two-family dwellings are not required to comply with this section.		X			Clarification
S148-19	**1902.1.1 Design displacement.** Design displacement at each level be the total lateral ~~displacement~~ deflection at the level calculated ~~expected~~ for the design ~~basis~~ earthquake using the procedures defined in ~~*, as specified by*~~ *Section 12.8.6 of ASCE 7.*		X			Clarification
S149-19	**1903.1 General.** Materials used to produce concrete, concrete itself and testing thereof shall comply with the applicable standards listed in ACI 318. ~~**Exception:** The following standards as referenced in Chapter 35 shall be permitted to be used.~~		X			Clarification

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Sub Code:						
	~~1. ASTM C150~~ ~~2. ASTM C595~~ ~~3. ASTM C1157~~					
S152-19	**SECTION 1906** **FOOTINGS FOR LIGHT-FRAME CONSTRUCTION** **1906.1 Plain concrete footings.** For Group R-3 occupancies and buildings of other occupancies less than two stories above grade plane of light-frame construction, the required thickness of plain concrete footings is permitted to be ~~reduced to~~ 6 inches (152 mm), provided that the footing does not extend more than 4 inches (102 mm) on either side of the supported wall.		X			Clarification
S155-19	**1908.1 General.** Shotcrete ~~is mortar or concrete that is pneumatically projected at high velocity onto a surface. Except as specified in this section, shotcrete shall conform to the requirements of this chapter for plain or reinforced concrete~~ shall be in accordance with the requirements of ACI 318. ~~**1908.2 Proportions and materials.** Shotcrete proportions shall be selected that allow suitable placement procedures using the delivery equipment selected and shall result in finished in-place hardened shotcrete meeting the strength requirements of this code.~~ ~~**1908.3 Aggregate.** Coarse aggregate, if used, shall not exceed $^3/_4$ inch (19.1 mm).~~ ~~**1908.4 Reinforcement.** Reinforcement used in shotcrete construction shall comply with the provisions of Sections 1908.4.1 through 1908.4.4.~~ ~~**1908.4.1 Size.** The maximum size of reinforcement shall be No. 5 bars unless it is demonstrated by preconstruction tests that adequate encasement of larger bars will be achieved.~~ ~~**1908.4.2 Clearance.** Where No. 5 or smaller bars are used, there shall be a minimum clearance between parallel reinforcement bars of $2^1/_2$ inches (64 mm). When bars larger than No. 5 are permitted, there shall be a minimum clearance between parallel bars equal to six diameters of the bars used. Where two curtains of steel are provided, the curtain nearer the nozzle shall have a minimum spacing equal to 12 bar diameters and the remaining curtain shall have a minimum spacing of six bar diameters.~~ ~~**Exception:**~~ ~~Subject to the approval of the building official, required clearances~~		X			Clarification

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Sub Code:						
	~~shall be reduced where it is demonstrated by preconstruction tests that adequate encasement of the bars used in the design will be achieved.~~ ~~**1908.4.3 Splices.** Lap splices of reinforcing bars shall utilize the noncontact lap splice method with a minimum clearance of 2 inches (51 mm) between bars. The use of contact lap splices necessary for support of the reinforcing is permitted where approved by the building official, based on satisfactory preconstruction tests that show that adequate encasement of the bars will be achieved, and provided that the splice is oriented so that a plane through the center of the spliced bars is perpendicular to the surface of the shotcrete.~~ ~~**1908.4.4 Spirally tied columns.** Shotcrete shall not be applied to spirally tied columns.~~ ~~**1908.5 Preconstruction tests.** Where preconstruction tests are required by Section 1908.4, a test panel shall be shot, cured, cored or sawn, examined and tested prior to commencement of the project. The sample panel shall be representative of the project and simulate job conditions as closely as possible. The panel thickness and reinforcing shall reproduce the thickest and most congested area specified in the structural design. It shall be shot at the same angle, using the same nozzleman and with the same concrete mix design that will be used on the project. The equipment used in preconstruction testing shall be the same equipment used in the work requiring such testing, unless substitute equipment is approved by the building official. Reports of preconstruction tests shall be submitted to the building official as specified in Section 1704.5.~~ ~~**1908.6 Rebound.** Any rebound or accumulated loose aggregate shall be removed from the surfaces to be covered prior to placing the initial or any succeeding layers of shotcrete. Rebound shall not be used as aggregate.~~ ~~**1908.7 Joints.** Except where permitted herein, unfinished work shall not be allowed to stand for more than 30 minutes unless edges are sloped to a thin edge. For structural elements that will be under compression and for construction joints shown on the approved construction documents, square joints are permitted. Before placing additional material adjacent to previously applied work, sloping and square edges shall be cleaned and wetted.~~					

	1908.8 Damage. In-place shotcrete that exhibits sags, sloughs, segregation, honeycombing, sand pockets or other obvious defects shall be removed and replaced. Shotcrete above sags and sloughs shall be removed and replaced while still plastic. **1908.9 Curing.** During the curing periods specified herein, shotcrete shall be maintained above 40°F (4°C) and in moist condition. **1908.9.1 Initial curing.** Shotcrete shall be kept continuously moist for 24 hours after shotcreting is complete or shall be sealed with an approved curing compound. **1908.9.2 Final curing.** Final curing shall continue for seven days after shotcreting, or for three days if high-early-strength cement is used, or until the specified strength is obtained. Final curing shall consist of the initial curing process or the shotcrete shall be covered with an approved moisture-retaining cover. **1908.9.3 Natural curing.** Natural curing shall not be used in lieu of that specified in this section unless the relative humidity remains at or above 85 percent, and is authorized by the registered design professional and approved by the building official. **1908.10 Strength tests.** Strength tests for shotcrete shall be made by an approved agency on specimens that are representative of the work and that have been water soaked for not fewer than 24 hours prior to testing. Where the maximum-size aggregate is larger than $^3/_8$ inch (9.5 mm), specimens shall consist of not less than three 3-inch-diameter (76 mm) cores or 3-inch (76 mm) cubes. Where the maximum-size aggregate is $^3/_8$ inch (9.5 mm) or smaller, specimens shall consist of not less than 2-inch-diameter (51 mm) cores or 2-inch (51 mm) cubes. **1908.10.1 Sampling.** Specimens shall be taken from the in-place work or from test panels, and shall be taken not less than once each shift, but not less than one for each 50 cubic yards (38.2 m^3) of shotcrete. **1908.10.2 Panel criteria.** Where the maximum-size aggregate is larger than $^3/_8$ inch (9.5 mm), the test panels shall have minimum dimensions of 18 inches by 18 inches (457 mm by 457 mm). Where the maximum-size aggregate is $^3/_8$ inch (9.5 mm) or smaller, the test panels shall have minimum dimensions of 12 inches by 12 inches (305 mm by 305 mm). Panels shall be shot in the same position as the work, during the course of the work and by the nozzlemen doing the work. The conditions under which the panels are cured shall be the same as the work. **1908.10.3 Acceptance criteria.** The average compressive strength of three cores from the in-place work or a single test panel shall equal or exceed 0.85 f'_c with no single core less than 0.75 f'_c. The average compressive strength of three cubes taken from the in-place work or a single test panel shall equal or exceed f'_c with no individual cube less					

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Sub Code:						
	~~than 0.88 f'_c. To check accuracy, locations represented by erratic core or cube strengths shall be retested.~~					
S156-19	**2109.2.4.8 Exterior finish.** Exterior finishes applied to adobe masonry walls shall be of any type permitted by ~~this code and shall comply with the provisions of~~ this section ~~and~~ or ~~with~~ Chapter 14, except where stated otherwise in this section. **2109.2.4.8.1 ~~Purpose, and type~~ Where required.** Unstabilized adobe masonry walls shall ~~be finished on their exterior with a plaster of any type in this section to provide protection from weather~~ receive a weather protective exterior finish in accordance with ~~this code~~ Section 2109.2.4.8. **2109.2.4.8.2 ~~Vapor retarders and v~~Vapor permeance.** ~~Class I and II vapor retarders shall not be used on any adobe masonry wall, nor shall any other material be used that has a vapor permeance rating of less than 5 perms.~~ Plaster and finish assemblies shall have a vapor permeance of not less than 5 perms. **Exception:** Insulation products applied to the exterior of stabilized adobe masonry walls in Climate Zones 2B, 3B, 4B and 5B shall have no vapor permeance requirement. **2109.2.4.8.3 Plaster thickness and coats.** Plaster applied to adobe masonry shall be not less than 7/8" (22 mm) and not greater than 2 inches (51 mm) thick. Plaster shall be applied in not less than two coats. **2109.2.4.8.4 Plaster application.** ~~Plaster shall be~~ Where plaster is applied directly to adobe masonry walls, no intermediate membrane shall be used. ~~any type of membrane to facilitate transpiration of moisture from the masonry units, and to secure a mechanical bond between the masonry and plaster~~.		X			Clarification

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	2109.2.4.8.5 Lath for plaster. Lath shall be provided for all plasters, except ~~as otherwise~~ where not required elsewhere in ~~this section~~ Section 2019.2.4.8. Fasteners shall be corrosion resistant and spaced at a maximum of 16 inches (406mm) on center ~~maximum~~ with a minimum 1-1/2 inches (38 mm) penetration into the adobe wall. Metal lath shall comply with ASTM C1063, as modified by this section, and shall be corrosion resistant. Plastic lath shall comply with ASTM C1788, as modified by this section. Wood substrates shall be protected with #15 asphalt felt, an *approved* wood preservative or other protective coating prior to lath application. **2109.2.4.8.6 Cement plaster.** Cement plaster shall conform to ASTM C926 and shall comply with Chapter 25, except that the proportion of lime in plaster coats shall not be less than 1 part lime to ~~6~~4 parts cement ~~to allow a minimum acceptable vapor permeability.~~ The combined thickness of cement plaster coats shall not ~~be more than~~ exceed 1 inch (25mm).					
S157-19	~~**2109.2.4.8.1 Conditions where lathing is not required.** For unstabilized adobe walls finished with clay-lime plaster, lathing shall be allowed to be omitted at the discretion of the Building Official when evidence of adequate mechanical bonding is demonstrated to and approved by the building official.~~ ~~**2109.2.4.8.2**~~ **2109.2.4.8.7 Lime Plaster.** Lime plaster is any plaster with a binder composed of calcium hydroxide, ~~(CaOH)~~ including Type N or S hydrated lime, hydraulic lime, natural hydraulic lime, or slaked quicklime. Hydrated lime shall comply with ASTM C206. Hydraulic lime shall comply with ASTM C1707. Natural hydraulic lime shall comply with ASTM C141 and EN 459. Quicklime shall comply with ASTM C5.		X			Clarification
S158-19	**2109.2.4.8 Exterior finish.** *Exterior walls* constructed of unstabilized adobe units shall have their exterior surface covered with not fewer than two coats of Portland cement plaster having a minimum thickness of 3/4 inch (19.1 mm) and conforming to ASTM C926. Lathing shall comply with ASTM C1063. Fasteners shall be spaced at 16 inches (406 mm) on center maximum. Exposed wood surfaces shall be treated with an *approved* wood preservative or other protective coating prior to lath application. **2109.2.4.8.1 Cement-lime plaster.** Cement-lime plaster shall be any plaster mix type CL, F or FL, as described in ASTM C926.		X			Adds cement-lime for adobe walls and removes ambiguities
S159-19	~~**2109.2.4.8.1**~~ **2109.2.4.8.9 Clay Plaster.** Clay plaster shall comply with this section.	X			Minimal	Clarification

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Sub Code:						
	~~**2109.2.4.8.2**~~ **2109.2.4.8.9.1 General.** Clay plaster shall be any plaster having a clay or clay subsoil binder. Such plaster shall contain sufficient clay to fully bind the~~ sand, fine~~ aggregate ~~or other granular material~~, and shall be permitted to contain reinforcing fibers. Acceptable reinforcing fibers include chopped straw, sisal, and animal hair. ~~**2109.2.4.8.3**~~ **2109.2.4.8.9.2 Clay subsoil requirements.** The suitability of clay subsoil shall be determined in accordance with the Figure 2 Ribbon Test and the Figure 3 Ball Test in the appendix of ASTM E2392/E2392M. ~~**2109.2.4.8.4**~~ **2109.2.4.8.9.3 Weather exposed locations.** Clay plaster exposed to water from direct or wind-driven rain, or snow~~, or irrigation spray~~ shall be finished with an ~~clay-lime plaster, lime plaster, or other~~ approved erosion-resistant finish. The use of clay plasters shall not be permitted on weather exposed parapets. ~~**2109.2.4.8.5**~~ **2109.2.4.8.9.4 Prohibited finish coat.** Plaster containing Portland cement shall not be permitted as a finish over clay plaster. ~~**2109.2.4.8.6**~~ **2109.2.4.8.9.5 Conditions where lathing is not required.** For unstabilized adobe walls finished with unstabilized clay plaster, lathing shall not be required.					
S160-19	**2205.2.1.1 Seismic Design Category B or C.** Structures assigned to *Seismic Design Category* B or C shall be of any construction permitted in Section 2205. Where a response modification coefficient, *R*, in accordance with ASCE 7, Table 12.2-1, is used for the design of structures assigned to *Seismic Design Category* B or C, the structures shall be designed and detailed in accordance with the requirements of AISC 341. Beam-to-column moment connections in special moment frames and intermediate moment frames shall be prequalified in accordance with AISC 341 Section K1, qualified by testing in accordance with AISC 341 Section K2, or shall be prequalified in accordance with AISC 358. **Exception:** The response modification coefficient, *R*, designated for "Steel systems not specifically detailed for seismic resistance, excluding cantilever column systems" in ASCE 7, Table 12.2-1, shall be permitted for systems designed and detailed in accordance with AISC 360, and need not be designed and detailed in accordance with AISC 341.		X			Provides updates to the latest prequalified connections.

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Sub Code:						
	2205.2.1.2 Seismic Design Category D, E or F. Structures assigned to *Seismic Design Category* D, E or F shall be designed and detailed in accordance with AISC 341, except as permitted in ASCE 7, Table 15.4-1. Beam-to-column moment connections in special moment frames and intermediate moment frames shall be prequalified in accordance with AISC 341 Section K1, qualified by testing in accordance with AISC 341 Section K2, or shall be prequalified in accordance with AISC 358.					
S161-19	**[BS] STORAGE RACKS, STEEL.** Cold-formed or hot-rolled steel structural members which are formed into steel storage racks, including pallet storage racks, movable-shelf racks, rack-supported systems, automated storage and retrieval systems (stacker racks), push-back racks, pallet-flow racks, case-flow racks, pick modules and rack-supported platforms. Other types of racks, such as drive-in or drive-through racks, cantilever racks, portable racks or racks made of materials other than steel, are not considered storage racks for the purpose of this code. **[BS] STORAGE RACKS, STEEL CANTILEVERED.** A framework or assemblage composed of cold-formed or hot-rolled steel structural members, primarily in the form of vertical columns, extended bases, horizontal arms projecting from the faces of the columns, and longitudinal (down-aisle) bracing between columns. There may be shelf beams between the arms, depending on the products being stored; this definition does not include other types of racks such as pallet storage racks, drive-in racks, drive-through racks, or racks made of materials other than steel. **Revise as follows:** **2209.1 ~~Storage~~ Steel storage racks.** The design, testing and utilization of steel *storage racks* made of cold-formed or hot-rolled steel structural members shall be in accordance with RMI ANSI/MH 16.1. Where required by ASCE 7, the seismic design of *steel storage racks* shall be in accordance with Section 15.5.3 of ASCE 7. **2209.2 ~~Cantilevered steel~~ Steel cantilevered storage racks.** The design, testing, and utilization of *steel cantilevered storage racks* made of cold-formed or hot-rolled steel structural members shall be in accordance with RMI ANSI/MH 16.3. Where required by ASCE 7, the seismic design of *steel cantilevered storage racks* ~~steel~~ shall be in accordance with Section 15.5.3 of ASCE 7.		X			Clarifies what requirements apply to steel storage racks

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Sub Code:						
	1705.12.7 Storage racks. *Periodic special inspection* is required for the anchorage of *steel storage racks* and *steel cantilevered storage racks* that are 8 feet (2438 mm) or greater in height in structures assigned to *Seismic Design Category* D, E or F. **[Reserved under FBC]**					
S166-19	**2303.2 Fire-retardant-treated wood.** *Fire-retardant-treated wood* is any wood product that, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E84 or UL 723, a *listed* flame spread index of 25 or less. Additionally, the ASTM E84 or UL 723 test shall be continued for an additional 20-minute period and the flame front shall not progress more than $10^1/_2$ feet (3200 mm) beyond the centerline of the burners at any time during the ~~extended 30-minute~~ test.		X			Clarification
S167-19	**2303.2.3 Fire Testing Of Wood Structural Panels.** Wood structural panels shall be tested with a ripped or cut longitudinal gap of 1/8" (3.2 mm).		X			Clarification
S168-19	**PERMANENT INDIVIDUAL TRUSS MEMBER RESTRAINT (*PITMR*).** Restraint that is used to prevent local buckling of an individual truss chord or web member because of the axial forces in the individual truss member. **PERMANENT INDIVIDUAL TRUSS MEMBER DIAGONAL BRACING (*PITMDB*).** Structural member or assembly intended to permanently stabilize the *PITMR*'s. **INDIVIDUAL TRUSS MEMBER.** A truss chord or truss web. **2303.4.1.1 Truss design drawings.** The written, graphic and pictorial depiction of each individual truss shall be provided to the *building official* for approval prior to installation. Truss design drawings shall be provided with the shipment of trusses delivered to the job site. Truss design drawings shall include, at a minimum, the following information: 1. Slope or depth, span and spacing. 2. Location of all joints and support locations. 3. Number of plies if greater than one. 4. Required bearing widths. 5. Design loads as applicable, including: 5.1. Top chord live load. 5.2. Top chord dead load. 5.3. Bottom chord live load. 5.4. Bottom chord dead load. 5.5. Additional loads and locations.		X			Clarification

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Sub Code:						
	5.6. Environmental design criteria and loads (such as wind, rain, snow, seismic). 6. Other lateral loads, including drag strut loads. 7. Adjustments to wood member and metal connector plate design value for conditions of use. 8. Maximum reaction force and direction, including maximum uplift reaction forces where applicable. 9. Joint connection type and description, such as size and thickness or gage, and the dimensioned location of each joint connector except where symmetrically located relative to the joint interface. 10. Size, species and grade for each wood member. 11. Truss-to-truss connections and truss field assembly requirements. 12. Calculated span-to-deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable. 13. Maximum axial tension and compression forces in the truss members. 14. Required permanent individual truss member restraint location and the method and details of restraint~~/~~ and diagonal bracing to be used in accordance with Section 2303.4.1.2. **2303.4.1.2 Permanent individual truss member restraint (PITMR) and permanent individual truss member diagonal bracing (PITMDB).** Where ~~permanent restraint of truss members is required on~~ the truss design drawings designate the need for *permanent individual truss member restraint,* it shall be accomplished by one of the following methods: 1. ~~Permanent individual truss member restraint/bracing shall be~~ *PITMR* and *PITMDB* installed using standard industry lateral restraint ~~/~~and diagonal bracing details in accordance with ~~generally~~ TPI 1 section 2.3.3.1.1, accepted engineering practice, or Figures 2303.4.1.2(1a), (2a), and (3). ~~Locations for lateral restraint shall be identified on the truss design drawing.~~ 2. *Individual truss member* reinforcement in place of the specified lateral restraints (i.e., buckling reinforcement such as T-reinforcement, L-reinforcement, proprietary reinforcement, etc.) such ~~2.The trusses shall be designed so~~ that the buckling of any *individual truss member* is resisted internally by the individual ~~truss through suitable means (for example, buckling reinforcement by T-reinforcement or L-reinforcement,~~					

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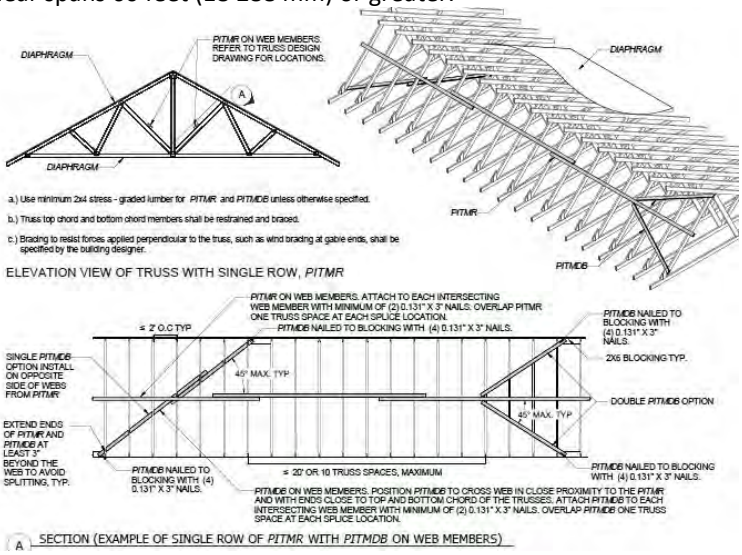
	~~proprietary reinforcement).~~ truss. The buckling reinforcement of *individual truss members* ~~of the trusses~~ shall be installed as shown on the truss design drawing or on supplemental truss member buckling reinforcement details provided by the truss designer or in accordance with Figures 2303.4.1.2 (1b) and (2b). 3. A project-specific ~~permanent individual truss member restraint/bracing design shall be permitted to be specified~~ *PITMR* and *PITMDB* design provided by any *registered design professional*. **2303.4.1.2.1 Trusses installed without a diaphragm** Trusses installed without a diaphragm on the top or bottom chord shall require a project specific PITMR and PITMDB design prepared by a registered design professional. **Exception:** Group U occupancies. **2303.4.1.3 Trusses spanning 60 feet or greater.** The *owner* or the *owner*'s authorized agent shall contract with any qualified *registered design professional* for the design of the temporary installation restraint ~~/~~and diagonal bracing and the ~~permanent individual truss member restraint/bracing~~ *PITMR* and *PITMDB* for all trusses with clear spans 60 feet (18 288 mm) or greater.  **FIGURE 2303.4.1.2.(1a)** **PITMR AND PITMDB FOR TRUSS WEB MEMBERS REQUIRING ONE ROW OF PITMR**					

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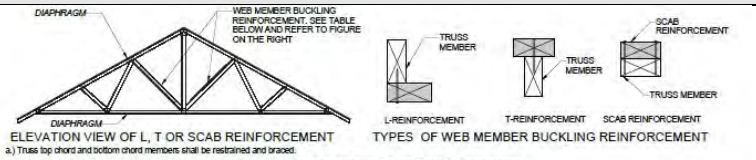


a.) Truss top chord and bottom chord members shall be restrained and braced.

b.) Bracing to resist forces applied perpendicular to the truss, such as wind bracing at gable ends, shall be specified by the building designer.

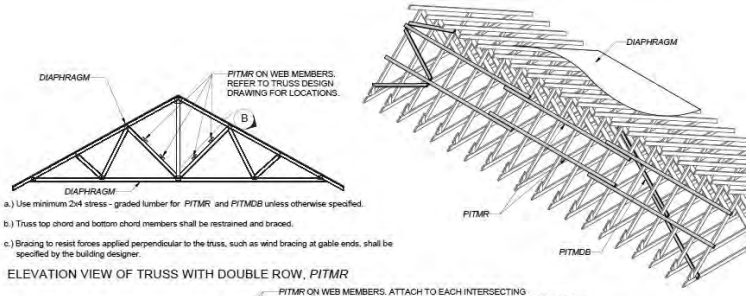
c.) Use the table below unless project specific web member reinforcement is provided on the truss design drawing or supplemental truss buckling reinforcement details are provided by the truss designer.

NUMBER OF ROWS OF PITMR SPECIFIED ON WEB MEMBER	SIZE OF TRUSS WEB	TYPE AND SIZE OF WEB REINFORCEMENT[1] FOR T, L OR SCAB[2]	GRADE OF WEB REINFORCEMENT	MINIMUM LENGTH OF WEB REINFORCEMENT	MINIMUM CONNECTION OF WEB REINFORCEMENT TO WEB
ONE	2x4	2x4	Same species and grade or better than web member	90% of web or extend to within 6" of end of web member, whichever is greater	(0.131" x 3") nails at 6" on-center[2]
	2x6	2x6			
	2x8	2x8			

[1]Maximum allowable web length is 14'

[2]Attach Scab reinforcement to web with two rows of minimum 0.131" x 3" nails at 6" on-center

FIGURE 2303.4.1.2.(1b)
ALTERNATIVE INSTALLATION USING BUCKLING REINFORCEMENT FOR TRUSS WEB MEMBERS IN LIEU OF ONE ROW OF *PITMR*



a.) Use minimum 2x4 stress - graded lumber for *PITMR* and *PITMDB* unless otherwise specified.

b.) Truss top chord and bottom chord members shall be restrained and braced.

c.) Bracing to resist forces applied perpendicular to the truss, such as wind bracing at gable ends, shall be specified by the building designer.

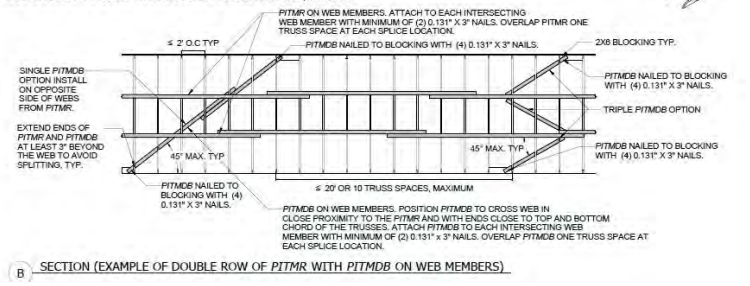
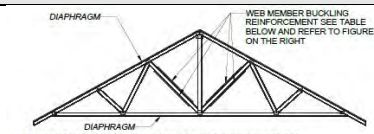
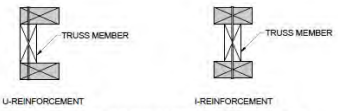


FIGURE 2303.4.1.2.(2a)
PITMR AND PITMDB FOR TRUSS WEB MEMBERS REQUIRING TWO ROWS OF PITMR

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact							
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						



ELEVATION VIEW OF I OR U REINFORCEMENT



TYPES OF WEB MEMBER BUCKLING REINFORCEMENT

a.) Truss top chord and bottom chord members shall be restrained and braced.

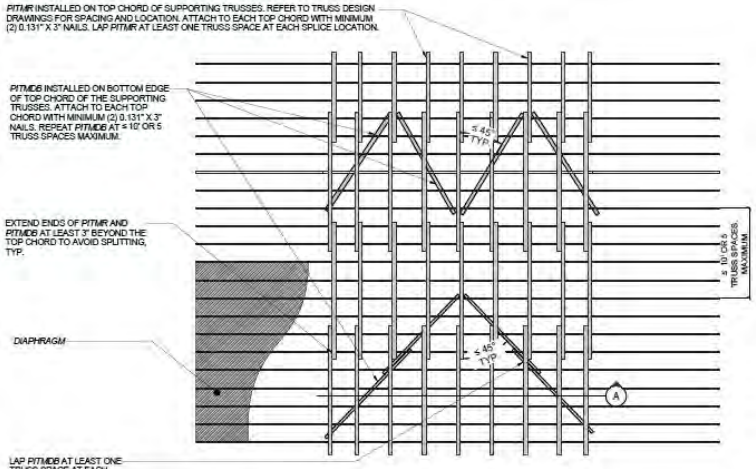
b.) Bracing to resist forces applied perpendicular to the truss, such as wind bracing at gable ends, shall be specified by the building designer.

c.) Use the table below unless project specific web member reinforcement is provided on the truss design drawing or supplemental truss buckling reinforcement details are provided by the truss designer.

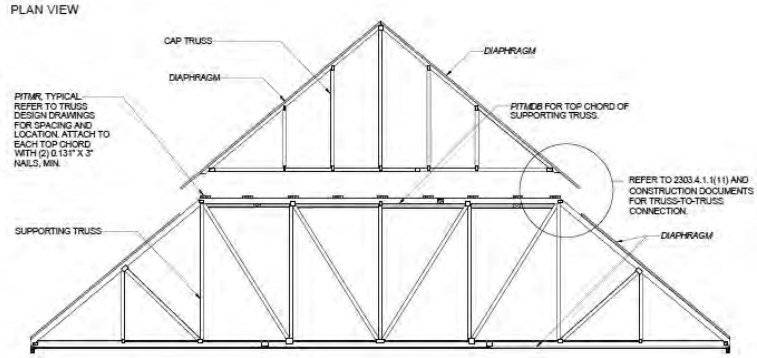
NUMBER OF ROWS OF PITMR SPECIFIED ON WEB MEMBER	SIZE OF TRUSS WEB	TYPE AND SIZE OF WEB FOR I OR U REINFORCEMENT*	GRADE OF WEB REINFORCEMENT	MINIMUM LENGTH OF WEB REINFORCEMENT	MINIMUM CONNECTION OF WEB REINFORCEMENT TO WEB
TWO	2x4	(2) -2x4	Same species and grade or better than web member	90% of web or extend to within 6" of end of web member, whichever is greater	(0.131" x 3") nails at 6" on-center
	2x6	(2) -2x6			
	2x8	(2) -2x8			

*Maximum allowable web length is 14'

FIGURE 2303.4.1.2.(2b)
ALTERNATIVE INSTALLATION USING BUCKLING REINFORCEMENT FOR TRUSS WEB MEMBERS IN LIEU OF TWO ROWS OF *PITMR*



PLAN VIEW



a.) Use minimum 2x4 stress - graded lumber for PITMR and PITMDB unless otherwise specified.
b.) Web PITMR and PITMDB not shown for clarity.
c.) Truss top chord and bottom chord members shall be restrained and braced.
d.) Bracing to resist forces applied perpendicular to the truss, such as wind bracing at gable ends, shall be specified by the building designer.

SECTION AT A

FIGURE 2303.4.1.2 (3)

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	PITMR AND PITMDB FOR FLAT PORTION OF TOP CHORD IN A PIGGYBACK ASSEMBLY					
S169-19	**2303.7 Shrinkage.** Consideration shall be given in design ~~to~~ for the ~~possible effect~~ effects of wood cross-grain dimensional changes ~~considered vertically~~ that ~~may~~ occur ~~in lumber fabricated in a green condition.~~as a result of changes in the wood moisture content after installation.		X			Clarification
S170-19	**2304.10.1 Connection fire resistance rating.** Fire resistance ratings for connections in Type IV-A, IV-B, or IV-C construction shall be determined by one of the following: 1. Testing in accordance with Section 703.2 where the connection is part of the fire resistance test. 2. Engineering analysis that demonstrates that the temperature rise at any portion of the connection is limited to an average temperature rise of 250°F (139°C), and a maximum temperature rise of 325°F (181°C), for a time corresponding to the required fire resistance rating of the structural element being connected. For the purposes of this analysis, the connection includes connectors, fasteners, and portions of wood members included in the structural design of the connection.		X			Necessary addition for clarification
S172-19	**2304.9 Lumber decking.** Lumber decking shall be designed and installed in accordance with the general provisions of this code and Sections 2304.9.1 through 2304.9.5.3. Other lumber decking patterns and connection designs shall be substantiated through engineering analysis. **2304.9.1 General.** Each piece of lumber decking shall be square-end trimmed. Where random lengths are furnished, each piece shall be square end trimmed across the face so that not less than 90 percent of the pieces are within 0.5 degrees (0.00873 rad) of square. The ends of the pieces shall be permitted to be beveled up to 2 degrees (0.0349 rad) from the vertical with the exposed face of the piece slightly longer than the opposite face of the piece. Tongue-and-groove decking shall be installed with the tongues up on sloped or pitched roofs with pattern faces down. **2304.9.2 Layup patterns.** Lumber decking is permitted to be laid up following one of five standard patterns as defined in Sections 2304.9.2.1 through 2304.9.2.5. ~~Other patterns are permitted to be used provided that they are substantiated through engineering analysis.~~		X			Clarification
S173-19	**TABLE 2304.10.1 FASTENING SCHEDULE**			X	Minimal	Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
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		Decrease	None	Increase		
Sub Code:						
	a. Nails spaced at 6 inches at intermediate supports where spans are 48 inches or more. For nailing of wood structural panel and particleboard diaphragms and shear walls, refer to Section 2305. Nails for wall sheathing are permitted to be common, box or casing. b. Spacing shall be 6 inches on center on the edges and 12 inches on center at intermediate supports for nonstructural applications. Panel supports at 16 inches (20 inches if strength axis in the long direction of the panel, unless otherwise marked). c. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule and the ceiling joist is fastened to the top plate in accordance with this schedule, the number of toenails in the rafter shall be permitted to be reduced by one nail. d. RSRS-01 is a Roof Sheathing Ring Shank nail meeting the specifications in ASTM F1667. e. Tabulated fastener requirements apply where the ultimate design wind speed is less than 140 mph. For wood structural panel roof sheathing attached to gable end roof framing and to intermediate supports within 48 inches of roof edges and ridges, nails shall be spaced at 4 inches on center where the ultimate design wind speed is greater than 130 mph in Exposure B or greater than 110 mph in Exposure C. Spacing exceeding 6 inches on center at intermediate supports shall be permitted where the fastening is designed per the AWC NDS. f. Fastening is only permitted where ~~Where~~ the ultimate design wind speed is less than or equal to 110 mph~~, roof sheathing attachment using the specified fasteners shall be installed 3 inches on center at all supports~~.					
S174-19	**TABLE 2304.10.1** **FASTENING SCHEDULE** a. Nails spaced at 6 inches at intermediate supports where spans are 48 inches or more. For nailing of wood structural panel and particleboard diaphragms and shear walls, refer to Section 2305. Nails for wall sheathing are permitted to be common, box or casing. b. Spacing shall be 6 inches on center on the edges and 12 inches on center at intermediate supports for nonstructural applications. Panel supports at 16 inches (20 inches if strength axis in the long direction of the panel, unless otherwise marked). c. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule and the ceiling joist is		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
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Sub Code:						
	fastened to the top plate in accordance with this schedule, the number of toenails in the rafter shall be permitted to be reduced by one nail. d. RSRS-01 is a Roof Sheathing Ring Shank nail meeting the specifications in ASTM F1667. e. Nails and staples are carbon steel meeting the specifications of ASTM F1667. Connections using nails and staples of other materials, such as stainless steel, shall be designed by acceptable engineering practice or approved under Section 104.11.					
S175-19	**2304.12.1 Locations requiring waterborne preservatives or naturally durable wood.** Wood used above ground in the locations specified in Sections 2304.12.1.1 through 2304.12.1.5~~, 2304.12.3~~ and ~~2304.12.5~~ shall be naturally durable wood or *preservative-treated wood* using waterborne preservatives, in accordance with AWPA U1 for above-ground use. **2304.12.1.1 Joists, girders and subfloor.** Wood joists or wood structural floors that are closer than 18 inches (457 mm) or wood girders that are closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated areas located within the perimeter of the building foundation shall be of naturally durable or *preservative-treated wood*. **2304.12.1.2 Wood supported by exterior foundation walls.** Wood framing members, including wood sheathing, that are in contact with exterior foundation walls and are less than 8 inches (203 mm) from exposed earth shall be of naturally durable or *preservative-treated wood*. **2304.12.1.3 Exterior walls below grade.** Wood framing members and furring strips in direct contact with the interior of exterior masonry or concrete walls below grade shall be of naturally durable or *preservative-treated wood*. **2304.12.1.4 Sleepers and sills.** Sleepers and sills on a concrete or masonry slab that is in direct contact with earth shall be of naturally durable or *preservative-treated wood*.		X			Clarification

	2304.12.1.5 Wood siding. Clearance between wood siding and earth on the exterior of a building shall be not less than 6 inches (152 mm) or less than 2 inches (51 mm) vertical from concrete steps, porch slabs, patio slabs and similar horizontal surfaces exposed to the weather except where siding, sheathing and wall framing are of naturally durable or *preservative-treated wood*. **2304.12.2 Other locations.** Wood used in the locations specified in Sections 2304.12.2.1 through 2304.12.2.5 shall be naturally durable wood or *preservative-treated* wood in accordance with AWPA U1. *Preservative-treated* wood used in interior locations shall be protected with two coats of urethane, shellac, latex epoxy or varnish unless waterborne preservatives are used. Prior to application of the protective finish, the wood shall be dried in accordance with the manufacturer's recommendations. **2304.12.2.1 Girder ends.** The ends of wood girders entering exterior masonry or concrete walls shall be provided with a $^1/_2$-inch (12.7 mm) airspace on top, sides and end, unless naturally durable or *preservative-treated wood* is used. **2304.12.2.2 Posts or columns.** Posts or columns supporting permanent structures and supported by a concrete or masonry slab or footing that is in direct contact with the earth shall be of naturally durable or *preservative-treated wood*. **Exception:** Posts or columns that meet all of the following: 1. Are not exposed to the weather, or are protected by a roof, eave, overhang, or other covering if exposed to the weather. 2. Are supported by concrete piers or metal pedestals projected not less than 1 inch (25 mm) above the slab or deck and are separated from the concrete pier by an impervious moisture barrier. 3. Are located not less than 8 inches (203 mm) above exposed earth. **2304.12.2.3 Supporting member for permanent appurtenances.** Naturally durable or *preservative-treated wood* shall be utilized for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances where such members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering to prevent moisture or water accumulation on the surface or at joints between members. **Exception:** Buildings located in a geographical region where experience has demonstrated that climatic conditions preclude the need to use durable materials where the structure is exposed to the weather. **2304.12.2.4 Laminated timbers.** The portions of glued-laminated timbers that form the structural supports of a building or other					

	structure and are exposed to weather and not fully protected from moisture by a roof, eave or similar covering shall be pressure treated with preservative or be manufactured from naturally durable or *preservative-treated wood*. **2304.12.2.5 Supporting members for permeable floors and roofs.** Wood structural members that support moisture-permeable floors or roofs that are exposed to the weather, such as concrete or masonry slabs, shall be of naturally durable or *preservative-treated wood* unless separated from such floors or roofs by an impervious moisture barrier. The impervious moisture barrier system protecting the structure supporting floors shall provide positive drainage of water that infiltrates the moisture-permeable floor topping. **2304.12.2.6 Ventilation beneath balcony or elevated walking surfaces.** Enclosed framing in exterior balconies and elevated walking surfaces that are exposed to rain, snow or drainage from irrigation shall be provided with openings that provide a net free cross-ventilation area not less than $^{1}/_{150}$ of the area of each separate space. **2304.12.3 Wood in contact with the ground or fresh water.** Wood used in contact with exposed earth shall be naturally durable for both decay and termite resistance or preservative treated in accordance with AWPA U1 for soil or fresh water use. **Exception:** Untreated wood is permitted where such wood is continuously and entirely below the ground-water level or submerged in fresh water. **2304.12.3.1 Posts or columns.** Posts and columns that are supporting permanent structures and embedded in concrete that is exposed to the weather or in direct contact with the earth shall be of *preservative-treated wood*. **2304.12.4 Termite protection.** In geographical areas where hazard of termite damage is known to be very heavy, wood floor framing in the locations specified in Section 2304.12.1.1 and exposed framing of exterior decks or balconies shall be of naturally durable species (termite resistant) or preservative treated in accordance with AWPA U1 for the species, product preservative and end use or provided with *approved* methods of termite protection. **2304.12.5 Wood used in retaining walls and cribs.** Wood installed in retaining or crib walls shall be preservative treated in accordance with AWPA U1 for soil and fresh water use.					
S176-19	**2304.12.2.3 Supporting member for permanent appurtenances.** Naturally durable or *preservative-treated wood* shall be utilized for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances where such members are exposed to the weather without adequate protection from a roof, eave, overhang or other		X			Clarification

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Sub Code:						
	covering to prevent moisture or water accumulation on the surface or at joints between members. **Exception:** ~~Buildings~~ Sawn lumber in buildings located in a geographical region where experience has demonstrated that climatic conditions preclude the need to use durable materials where the structure is exposed to the weather. ~~**2304.12.2.4 Laminated timbers.** The portions of glued-laminated timbers that form the structural supports of a building or other structure and are exposed to weather and not fully protected from moisture by a roof, eave or similar covering shall be pressure treated with preservative or be manufactured from naturally durable or preservative-treated wood.~~					
S177-19	**2304.12.2 Other locations.** Wood used in the locations specified in Sections 2304.12.2.1 through ~~2304.12.2.5~~ 2304.12.2.9 shall be naturally durable wood or *preservative-treated* wood in accordance with AWPA U1. *Preservative-treated* wood used in interior locations shall be protected with two coats of urethane, shellac, latex epoxy or varnish unless waterborne preservatives are used. Prior to application of the protective finish, the wood shall be dried in accordance with the manufacturer's recommendations. **2304.12.2.1 Girder ends.** The ends of wood girders entering exterior masonry or concrete walls shall be provided with a $^1/_2$-inch (12.7 mm) airspace on top, sides and end, unless naturally durable or *preservative-treated wood* is used. **2304.12.2.2 Posts or columns.** Posts or columns supporting permanent structures and supported by a concrete or masonry slab or footing that is in direct contact with the earth shall be of naturally durable or *preservative-treated wood*. **Exception:** Posts or columns that meet all of the following: 1. Are not exposed to the weather, or are protected by a roof, eave, overhang, or other covering if exposed to the weather. 2. Are supported by concrete piers or metal pedestals projected not less than 1 inch (25 mm) above the slab or deck and are separated from the concrete pier by an impervious moisture barrier. 3. Are located not less than 8 inches (203 mm) above exposed earth.		X			Clarification

	2304.12.2.3 Supporting member for permanent appurtenances. Naturally durable or *preservative-treated wood* shall be utilized for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances where such members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering to prevent moisture or water accumulation on the surface or at joints between members. **Exception:** Buildings located in a geographical region where experience has demonstrated that climatic conditions preclude the need to use durable materials where the structure is exposed to the weather. **2304.12.2.4 Laminated timbers.** The portions of glued-laminated timbers that form the structural supports of a building or other structure and are exposed to weather and not fully protected from moisture by a roof, eave or similar covering shall be pressure treated with preservative or be manufactured from naturally durable or *preservative-treated wood*. **2304.12.2.5 Supporting members for permeable floors and roofs.** Wood structural members that support moisture-permeable floors or roofs that are exposed to the weather, such as concrete or masonry slabs, shall be of naturally durable or *preservative-treated wood* unless separated from such floors or roofs by an impervious moisture barrier. The impervious moisture barrier system protecting the structure supporting floors shall provide positive drainage of water that infiltrates the moisture-permeable floor topping. **2304.12.2.6 Ventilation beneath balcony or elevated walking surfaces.** Enclosed framing in exterior balconies and elevated walking surfaces that are exposed to rain, snow or drainage from irrigation shall be provided with openings that provide a net free cross-ventilation area not less than $^{1}/_{150}$ of the area of each separate space. ~~**2304.12.3**~~ **2304.12.2.7 Wood in contact with the ground or fresh water.** Wood used in contact with exposed earth shall be naturally durable for both decay and termite resistance or preservative treated in accordance with AWPA U1 for soil or fresh water use. **Exception:** Untreated wood is permitted where such wood is continuously and entirely below the ground-water level or submerged in fresh water. ~~**2304.12.3.1**~~ **2304.12.2.7.1 Posts or columns.** Posts and columns that are supporting permanent structures and embedded in concrete that is exposed to the weather or in direct contact with the earth shall be of *preservative-treated wood*.					

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Sub Code:						
	~~2304.12.4~~ **2304.12.2.8 Termite protection.** In geographical areas where hazard of termite damage is known to be very heavy, wood floor framing in the locations specified in Section 2304.12.1.1 and exposed framing of exterior decks or balconies shall be of naturally durable species (termite resistant) or preservative treated in accordance with AWPA U1 for the species, product preservative and end use or provided with *approved* methods of termite protection. ~~2304.12.5~~ **2304.12.2.9 Wood used in retaining walls and cribs.** Wood installed in retaining or crib walls shall be preservative treated in accordance with AWPA U1 for soil and fresh water use. ~~2304.12.6~~ **2304.12.3 Attic ventilation.** For *attic* ventilation, see Section 1202.2.2. ~~2304.12.7~~ **2304.12.4 Under-floor ventilation (crawl space).** For under-floor ventilation (crawl space), see Section 1202.4.					
S178-19	**2304.12.2.6 Ventilation beneath balcony or elevated walking surfaces.** Enclosed framing in exterior balconies and elevated walking surfaces that ~~are exposed to rain, snow or drainage from irrigation~~ have *weather-exposed surfaces* shall be provided with openings that provide a net free cross-ventilation area not less than $^1/_{150}$ of the area of each separate space.		X			Clarification
S180-19	**TABLE 2306.1.4** **ALLOWABLE LOADS FOR LUMBER DECKING** *Portions of table not shown remain unchanged.* **PATTERN** | **ALLOWABLE AREA LOAD[a, b]** (Flexure | Deflection) 3-inch and 4-inch decking | $\sigma_b = \frac{8\ \cancel{20}F_b'd^2}{\cancel{3}\ l^2 6}$ | $\sigma_\Delta = \frac{116\Delta E'd^3}{l^4\ 12}$ For SI: 1 inch = 25.4 mm. a. σ_b = Allowable total uniform load limited by bending. σ_Δ = Allowable total uniform load limited by deflection. b. *d* = Actual decking thickness. *l* = Span of decking. F_b' = Allowable bending stress adjusted by applicable factors. *E* = Modulus of elasticity adjusted by applicable factors.	X				Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
S181-19	**2306.1.4 Lumber decking.** The capacity of lumber decking arranged according to the patterns described in Section 2304.9.2 shall be the lesser of the capacities determined for ~~flexure~~ moment and deflection according to the formulas in Table 2306.1.4. **TABLE 2306.1.4** **ALLOWABLE LOADS FOR LUMBER DECKING** a. ~~F_b~~ w_b = Allowable total uniform load limited by ~~bending.~~ moment. ~~b. F_v~~ w_Δ = Allowable total uniform load limited by deflection. d = Actual decking thickness. l = Span of decking. F_b' = Allowable bending stress adjusted by applicable factors. E = Modulus of elasticity adjusted by applicable factors.		X			Clarification
S182-19	**TABLE 2306.3(3)** **ALLOWABLE SHEAR VALUES FOR WIND OR SEISMIC FORCES FOR SHEAR WALLS OF LATH AND PLASTER OR GYPSUM BOARD WOOD FRAMED WALL ASSEMBLIES UTILIZING STAPLES** a. These shear walls shall not be used to resist loads imposed by masonry or concrete walls (see AWC SDPWS). Values shown are for short-term loading due to wind or seismic loading. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7. Values shown shall be reduced 25 percent for normal loading. b. Applies to fastening at studs, top and bottom plates and blocking. c. Except as noted, shear values are based on a maximum framing spacing of 16 inches on center. d. Maximum framing spacing of 24 inches on center. e. All edges are blocked, and edge fastening is provided at all supports and all panel edges. f. Staples shall have a minimum crown width of 7/16 inch, measured outside the legs, and shall be installed with their crowns parallel to the long dimension of the framing members. g. Staples for the attachment of gypsum lath and woven-wire lath shall have a minimum crown width of 3/4 inch, measured outside the legs.		X			Clarification
S183-19 Part I	**2308.5.6 Cripple walls.** Foundation cripple walls shall be framed of studs that are not less than the size of the studding above ~~and~~. Exterior cripple wall studs shall be not less than 14 inches (356 mm) in length, or shall be framed of solid blocking. Where exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional *story*. See Section 2308.6.6 for cripple wall bracing.	X			Minimal	Clarification
S183-19 Part II	**R602.9 Cripple walls.** Foundation cripple walls shall be framed of studs not smaller than the studding above. Where exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional *story*.	X			Minimal	Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~Cripple~~ Exterior cripple walls with a stud height less than 14 inches (356 mm) shall be continuously sheathed on one side with wood structural panels fastened to both the top and bottom plates in accordance with Table R602.3(1), or the cripple walls shall be constructed of solid blocking. Cripple walls shall be supported on continuous foundations.					
S184-19 Part I	**[Reserved under FBC]** **2308.5.9 Cutting and notching.** In exterior walls and bearing partitions, a wood ~~studs are permitted to~~ stud shall not be cut or notched ~~to a depth not exceeding 25 percent of the width of the stud. Cutting or notching of studs to a depth not greater than 40 percent of the width of the stud is permitted in nonbearing partitions not supporting~~ in excess of 25 percent of its depth. In nonbearing partitions that do not support loads other than the weight of the partition, a stud shall not be cut or notched in excess of 40 percent of its depth. **2308.5.10 Bored holes.** ~~Bored holes not greater than~~ The diameter of bored holes in wood studs shall not exceed 40 percent of the stud ~~width are permitted to be bored in any wood stud. Bored holes not greater than~~ depth. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud ~~width are permitted in nonbearing partitions or~~ depth in nonbearing partitions. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in any wall where each ~~bored~~ stud is doubled, provided that not more than two such successive doubled studs are so bored. The edge of ~~a~~ the bored hole shall not be ~~nearer~~ closer than 5/8 inch (15.9 mm) to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch. **[BS] 302.3.3 Stud cutting and notching.** In exterior walls and bearing partitions, ~~any~~ a wood stud ~~is permitted to~~ shall not be cut or notched ~~to a depth not exceeding~~ in excess of 25 percent of its ~~width. Cutting or notching of studs to a depth not greater than 40 percent of the width of the stud is permitted in nonload-bearing partitions supporting no loads other than the weight of the partition~~ depth. In nonbearing partitions that do not support loads other than the weight of the partition, a stud shall not be cut or notched in excess of 40 percent of its depth.		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact

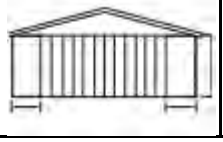
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	[BS] C101.2 Stud cutting and notching. In exterior walls and bearing partitions, ~~any~~ a wood stud ~~is permitted to~~ shall not be cut or notched ~~to a depth not exceeding~~ in excess of 25 percent of its ~~width. Cutting or notching of studs to a depth not greater than 40 percent of the width of the stud is permitted in nonbearing partitions supporting no~~ depth. In nonbearing partitions that do not support loads other than the weight of the partition, a stud shall not be cut or notched in excess of 40 percent of its depth. **[BS] C101.3 Bored holes.** The diameter of bored holes in wood studs shall not exceed 40 percent of the stud depth. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in nonbearing partitions. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in any wall where each stud is doubled, provided that not more than two such successive doubled studs are so bored. The edge of the bored hole shall be not ~~be~~ closer than $^{5}/_{8}$ inch (15.9 mm) to the edge of the stud. Bored holes shall be not located at the same section of stud as a cut or notch.					
S185-19	**2308.6.6.2 Cripple wall bracing in Seismic Design Categories D and E.** For the purposes of this section, cripple walls in *Seismic Design Categories* D and E ~~having~~ shall not have a stud height exceeding 14 inches (356 mm) ~~shall be considered to be a story and~~ , and studs shall be ~~braced~~ solid blocked in accordance with ~~Table 2308.6.1. Where interior braced wall lines occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be one and one-half times the lengths required by Table 2308.6.1. Where the cripple wall sheathing type used is Method WSP or DWB and this additional length of bracing cannot be provided, the capacity of WSP or DWB sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) on center.~~ Section 2308.5.6 for the full dwelling perimeter and for the full length of interior braced walls lines supported on foundations, excepting ventilation and access openings.		X			Clarification
S186-19	**TABLE 2308.6.3(1)** **BRACING METHODS** *Portions of table not shown remain unchanged.* **METHODS, MATERIAL** | **MINIMUM THICKNESS** | **FIGURE** | **CONNECTION CRITERIA[a]** (Fasteners | Spacing) PCP Portland cement plaster | Section 2510 to studs at maximum of 16" o.c. |  | $1^{1}/_{2}$" long, 11 gage, 0.120" dia., $^{7}/_{16}$" dia. head nails or $^{7}/_{8}$" long, 16 gage staples | 6" o.c. on all framing members For SI: 1 foot = 304.8 mm, 1 degree = 0.01745 rad. a. Method LIB shall have gypsum board fastened to one or more side(s) with nails or screws		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
S187-19	<table><tr><th>H_C/H_R</th><th>Heel Joint Connection Adjustment Factor</th></tr><tr><td>1/3</td><td>1.5</td></tr><tr><td>1/4</td><td>1.33</td></tr><tr><td>1/5</td><td>1.25</td></tr><tr><td>1/6</td><td>1.2</td></tr><tr><td>1/10 or less</td><td>1.11</td></tr></table> **TABLE 2308.7.3.1** **RAFTER TIE CONNECTIONS** a. 10d common (3" x 0.148") nails shall be permitted to be substituted for 16d common ($3^1/_2$" × 0.162") nails where the required number of nails is taken as 1.2 times the required number of 16d common nails, rounded up to the next full nail. b. Rafter tie heel joint connections are not required where the ridge is supported by a load-bearing wall, header or ridge beam. c. Where intermediate support of the rafter is provided by vertical struts or purlins to a load-bearing wall, the tabulated heel joint connection requirements are permitted to be reduced proportionally to the reduction in span. d. Equivalent nailing patterns are required for ceiling joist to ceiling joist lap splices. e. Connected members shall be of sufficient size to prevent splitting due to nailing. f. For snow loads less than 30 pounds per square foot, the required number of nails is permitted to be reduced by multiplying by the ratio of actual snow load plus 10 divided by 40, but not less than the number required for no snow load. g. Applies to roof live load of 20 psf or less. h. Tabulated heel joint connection requirements assume that ceiling joists or rafter ties are located at the bottom of the attic space. Where ceiling joists or rafter ties are located higher in the attic, heel joint connection requirements shall be increased by the following factors: where: H_C = Height of ceiling joists or rafter ties measured vertically ~~above~~ from the top of the rafter support walls to the bottom of the ceiling joists or rafter ties. H_R = Height of roof ridge measured vertically ~~above~~ from the top of the rafter support walls to the bottom of the roof ridge. When H_C / H_R exceeds 1/3, connections shall be designed in accordance with accepted engineering practice. i. Tabulated requirements are based on 10 psf roof dead load in combination with the specified roof snow load and roof live load.		X			Clarification
S188-19	**2401.1 Scope.** The provisions of this chapter shall govern the materials, design, construction and quality of glass, light-transmitting ceramic and light-transmitting plastic panels for exterior and interior use in both vertical and sloped applications in buildings and		X			Clarification

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	structures. Light-transmitting plastic glazing shall also meet the applicable requirements of Chapter 26.					
S189-19	**2403.3 Glass Framing.** To be considered firmly supported, the framing members for each individual pane of glass shall be designed so that the deflection of the edge of the glass perpendicular to the glass pane does not exceed $^{1}/_{175}$ of the glass edge length where the glass edge length is not more than 13 feet 6 inches (4115 mm) or 1/240 of the glass edge length + 1/4 inch (6.4 mm) where the glass edge length is greater than 13 feet 6 inches (4115 mm), when subjected to the larger of the positive or negative load where loads are combined as specified in Section 1605.		X			Clarification
S190-19	**2405.1 Scope.** This section applies to the installation of glass and other transparent, translucent or opaque glazing material installed at a slope of more than 15 degrees (0.26 rad) from the vertical plane, including glazing materials in skylights, roofs and sloped walls. **2405.2 Allowable glazing materials and limitations.** Sloped glazing shall be any of the following materials, subject to the listed limitations. 1. For monolithic glazing systems, the glazing material of the single light or layer shall be laminated glass with a minimum 30-mil (0.76 mm) polyvinyl butyral (or equivalent) interlayer, wired glass, light-transmitting plastic materials meeting the requirements of Section 2607, heat-strengthened glass or fully tempered glass. 2. For multiple-layer glazing systems, each light or layer shall consist of any of the glazing materials specified in Item 1. Annealed glass is permitted to be used as specified in Exceptions 2 and 3 of Section 2405.3. Laminated glass and plastic materials described above shall not require the screening or height restrictions provided in Section 2405.3. For additional requirements for plastic skylights, see Section 2610. Glass-block construction shall conform to the requirements of Section 2110.1.		X			Clarification

	2405.3 Screening. Where used in monolithic glazing systems, annealed, heat-strengthened, ~~and~~ fully tempered and wired glass shall have broken glass retention screens installed below the glazing material. The screens and their fastenings shall be: capable of supporting twice the weight of the glazing; firmly and substantially fastened to the framing members; and installed within 4 inches (102 mm) of the glass. The screens shall be constructed of a noncombustible material not thinner than No. 12 B&S gage (0.0808 inch) with mesh not larger than 1 inch by 1 inch (25 mm by 25 mm). In a corrosive atmosphere, structurally equivalent noncorrosive screen materials shall be used. Annealed, ~~H~~heat-strengthened ~~glass~~, fully tempered ~~glass~~ and wired glass, where used in multiple-layer glazing systems as the bottom glass layer over the walking surface, shall be equipped with screening that conforms to the requirements for monolithic glazing systems. **Exception:** In monolithic and multiple-layer sloped glazing systems, the following applies: 1. Fully tempered glass installed without protective screens where glazed between intervening floors at a slope of 30 degrees (0.52 rad) or less from the vertical plane shall have the highest point of the glass 10 feet (3048 mm) or less above the walking surface. 2. Screens are not required below any glazing material, including annealed glass, where the walking surface below the glazing material is permanently protected from the risk of falling glass or the area below the glazing material is not a walking surface. 3. Any glazing material, including annealed glass, is permitted to be installed without screens in the sloped glazing systems of commercial or detached noncombustible greenhouses used exclusively for growing plants and not open to the public, provided that the height of the greenhouse at the ridge does not exceed 30 feet (9144 mm) above grade. 4. Screens shall not be required in individual dwelling units in Groups R-2, R-3 and R-4 where fully tempered glass is used as single glazing or as both panes in an insulating glass unit, and the following conditions are met: 4.1. Each pane of the glass is 16 square feet (1.5 m2) or less in area. 4.2. The highest point of the glass is 12 feet (3658 mm) or less above any walking surface or other accessible area. 4.3. The glass thickness is 3/16 inch (4.8 mm) or less. 5. Screens shall not be required for laminated glass with a 15-mil (0.38 mm) polyvinyl butyral (or equivalent) interlayer used in individual dwelling units in Groups R-2, R-3 and R-4 within the following limits: 5.1. Each pane of glass is 16 square feet (1.5 m2) or less in area. 5.2. The highest point of the glass is 12 feet (3658 mm) or less above a walking surface or other accessible area.					

Table 10. 2021 IBC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IBC STRUCTURAL CHANGE SUMMARY	IBC STRUCTURAL COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
S192-19	**2407.1.2 Guards with structural glass balusters ~~panels~~.** Guards with structural glass balusters, whether vertical posts, columns or panels, shall be installed with an attached top rail or handrail. The top rail or handrail shall be supported by not fewer than three glass balusters, or shall be otherwise supported to remain in place should one glass baluster fail. **Exception:** An attached top rail or handrail is not required where the glass ~~balusters~~ panels are laminated glass with two or more glass plies of equal thickness and of the same glass type. The balusters shall be tested to remain in place as a barrier following impact or glass breakage in accordance with ASTM E2353.		X			Clarification
S196-19	**2510.6.1 Dry climates.** One of the following shall apply for dry (B) *climate zones*: 1. The *water-resistive barrier* shall be two layers of 10-minute Grade D paper or have a water resistance equal to or greater than two layers of *water-resistive barrier* complying with ASTM E2556, Type I. The individual layers shall be installed independently such that each layer provides a separate continuous plane and any flashing, installed in accordance with Section 1404.4 and intended to drain to the *water-resistive barrier*, is directed between the layers. 2. The *water-resistive barrier* shall be 60-minute Grade D paper or have a water resistance equal to or greater than one layer of *water-resistive barrier* complying with ASTM E2556, Type II. The water-resistive barrier shall be separated from the stucco by a layer of foam plastic insulating sheathing or other nonwater absorbing layer, or a drainage space. **2510.6.2 Moist or marine climates.** In moist (A) or marine (C) *climate zones*, water-resistive barrier shall comply with of one of the following: 1. In addition to complying with Item 1 or 2 of Section 2510.6.1, a space or drainage material not less than ~~minimum~~ 3/16 inch (4.8 mm) in depth ~~space~~ shall be applied ~~added~~ to the exterior side of the *water-resistive barrier.* 2. In addition to complying with Item 2 of Section 2510.6.1, drainage on the exterior side of the water-resistive barrier shall have ~~a space with~~ a minimum drainage efficiency of 90% as measured in accordance with ASTM E2273 or Annex A2 of ASTM E2925 ~~is added to the exterior side of the *water-resistive barrier*.~~			X	Minimal	Clarification

APPENDIX K

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RB163-19	**R102.7.1 Additions, alterations or repairs.** *Additions*, *alterations* or repairs to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with the requirements of this code, unless otherwise stated. *Additions*, *alterations,* repairs and relocations shall not cause an existing structure to become ~~unsafe or adversely affect the performance of the building.~~ less compliant with the provisions of this code than the existing building or structure was prior to the addition, alteration or repair. An existing building together with its additions shall comply with the height limits of this code. Where the alteration causes the use or occupancy to be changed to one not within the scope of this code, the provisions of the International Existing Building Code shall apply.		X			Clarification
RB164-19	**TABLE R403.1(1) MINIMUM WIDTH AND THICKNESS FOR CONCRETE FOOTINGS FOR LIGHT-FRAME CONSTRUCTION (inches)[a, b, c, d]** *(No change to portions of tables or footnotes not shown)* d. Where the building width perpendicular to the wall footing is less than 32 feet, a 2 inch decrease in footing width and 1 inch decrease in footing depth is permitted for every 4 feet of decrease in building width, provided the minimum width is 12 inches (mm) and minimum depth is 6 inches (mm). **TABLE R403.1(2) MINIMUM WIDTH AND THICKNESS FOR CONCRETE FOOTINGS FOR LIGHT-FRAME CONSTRUCTION WITH BRICK VENEER OR LATH AND PLASTER (inches)[a, b, c, d]** d. Where the building width perpendicular to the wall footing is less than 32 feet, a 2 inch decrease in footing width and 1 inch decrease in footing depth is permitted for every 4 feet of decrease in building width, provided the minimum width is 12 inches (mm) and minimum depth is 6 inches (mm). **TABLE R403.1(3) MINIMUM WIDTH AND THICKNESS FOR CONCRETE FOOTINGS WITH CAST-IN-PLACE CONCRETE OR PARTIALLY GROUTED MASONRY WALL CONSTRUCTION (inches)[a, b, c, d]** d. Where the building width perpendicular to the wall footing is less than 32 feet, a 2 inch decrease in footing width and 1 inch decrease in footing depth is permitted for every 4 feet of decrease in building width, provided the minimum width is 12 inches (mm) and minimum depth is 6 inches (mm).			X	Minimal	Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RB166-19	**R404.1.3.3.6 Form materials and form ties.** Forms shall be made of wood, steel, aluminum, plastic, a composite of cement and foam insulation, a composite of cement and wood chips, or other *approved* material suitable for supporting and containing concrete. Forms shall be ~~accurately~~ positioned and secured before placing concrete and shall provide sufficient strength to contain concrete during the concrete placement operation. Form ties shall be steel, solid plastic, foam plastic, a composite of cement and wood chips, a composite of cement and foam plastic, or other suitable material capable of resisting the forces created by fluid pressure of fresh concrete. **R403.1.6 Foundation anchorage.** Wood sill plates and wood walls supported directly on continuous foundations shall be anchored to the foundation in accordance with this section. Cold-formed steel framing shall be anchored directly to the foundation or fastened to wood sill plates in accordance with Section R505.3.1 or R603.3.1, as applicable. Wood sill plates supporting cold-formed steel framing shall be anchored to the foundation in accordance with this section. Wood sole plates at all exterior walls on monolithic slabs, wood sole plates of *braced wall panels* at building interiors on monolithic slabs and all wood sill plates shall be anchored to the foundation with minimum $^1/_2$-inch-diameter (12.7 mm) anchor bolts spaced not greater than 6 feet (1829 mm) on center or *approved* anchors or anchor straps spaced as required to provide equivalent anchorage to $^1/_2$-inch-diameter (12.7 mm) anchor bolts. Bolts shall extend not less than 7 inches (178 mm) into concrete or grouted cells of concrete masonry units. The bolts shall be located in the middle third of the width of the plate. A nut and washer shall be tightened on each anchor bolt. There shall be not fewer than two bolts per plate section with one bolt located not more than 12 inches (305 mm) or less than seven bolt diameters from each end of the plate section. Interior bearing wall sole plates on monolithic slab foundation that are not part of a *braced wall panel* shall be positively anchored with *approved* fasteners. Sill plates and sole plates shall be protected against decay and termites where required by Sections R317 and R318. Anchor bolts shall be <u>permitted to be</u> located ~~after~~ the <u>while</u> concrete is ~~placed~~ still <u>plastic</u> and before it has set ~~in accordance with ACI 332~~. <u>Where anchor bolts resist placement or the consolidation of concrete around anchor bolts is impeded, the concrete shall be vibrated to ensure full contact between the anchor bolts and concrete.</u>	X			Minimal	Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Exceptions: 1. Walls 24 inches (610 mm) total length or shorter connecting offset braced wall panels shall be anchored to the foundation with not fewer than one anchor bolt located in the center third of the plate section and shall be attached to adjacent braced wall panels at corners as shown in Item 9 of Table R602.3(1). 2. Connection of walls 12 inches (305 mm) total length or shorter connecting offset *braced wall panels* to the foundation without anchor bolts shall be permitted. The wall shall be attached to adjacent braced wall panels at corners as shown in Item 9 of Table R602.3(1).					
RB168-19	To add some uniformity to the IRC Code, the following modification is proposed to the Table headers. Section R404.1 applies to foundation walls, which could be constructed with either masonry or concrete. Since the creation of the IRC, the masonry and concrete wall sections have been written and modified by different interest groups. In some instances there has been a lack of coordination between code provisions for the two materials. This is an attempt to bridge some of those differences so that the users of the IRC can see uniform language across the code. It is proposed that all affected Tables use the header "MAXIMUM UNSUPPORTED WALL HEIGHT" to describe these similar conditions.		X			Consolidates terminology across tables regardless of the materials to make it clear that the intent is the same for all tables
RB169-19	**R404.1.2.1 Masonry foundation walls**. Concrete masonry and clay masonry foundation walls shall be constructed as set forth in Table R404.1.1(1), R404.1.1(2), R404.1.1(3) or R404.1.1(4) and shall comply with applicable provisions of Section R606. In buildings assigned to **Seismic Design** Categories D_0, D_1 and D_2, concrete masonry and clay masonry foundation walls shall also comply with Section R404.1.4.1. Rubble stone masonry foundation walls shall be constructed in accordance with Sections R404.1.8 and R606.4.2. Rubble stone masonry walls shall not be used in Seismic Design Categories D_0, D_1 and D_2 or in townhouses in Seismic Design Category C.		X			Clarification
RB171-19	**R404.1.3.3.7.1 Steel reinforcement.** Steel reinforcement shall comply with the requirements of ASTM A615, A706, or A996. ASTM A996 bars produced from rail steel shall be Type R. In buildings assigned to **Seismic Design** Category A, B or C, the minimum yield strength of reinforcing steel shall be 40,000 psi (Grade 40) (276 MPa). In buildings assigned to Seismic Design Category D_0, D_1 or D_2, ~~reinforcing steel shall comply with~~ the ~~requirements of ASTM A706 for low-alloy steel with a~~ minimum yield strength ~~of~~ shall be 60,000 psi (Grade 60) (414 MPa).	X			Minimal	Clarification
RB173-19	**R406.2 Concrete and masonry foundation waterproofing.** In areas where a high water table or other severe soil-water conditions are		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	known to exist, exterior foundation walls that retain earth and enclose interior spaces and floors below *grade* shall be waterproofed from the higher of (a) the top of the footing or (b) 6 inches (152 mm) below the top of the basement floor, to the finished *grade*. Walls shall be waterproofed in accordance with one of the following: 1. Two-ply hot-mopped felts. 2. Fifty-five-pound (25 kg) roll roofing. ~~3. Six-mil (0.15 mm) polyvinyl chloride.~~ ~~4. Six-mil (0.15 mm)polyethylene~~ 5. Forty mil (1 mm) polymer modified asphalt 6. Sixty-mil (1.5 mm) flexible polymer cement. 7. One-eighth-inch (3 mm) cement-based, fiber-reinforced, waterproof coating. 8. Sixty-mil (1.5 mm) solvent-free liquid-applied synthetic rubber. All joints in membrane waterproofing shall be lapped and sealed with an adhesive compatible with the membrane. **Exception:** Organic-solvent-based products such as hydrocarbons, chlorinated hydrocarbons, ketones and esters shall not be used for ICF walls with expanded polystyrene form material. Use of plastic roofing cements, acrylic coatings, latex coatings, mortars and pargings to seal ICF walls is permitted. Cold-setting asphalt or hot asphalt shall conform to Type C of ASTM D449. Hot asphalt shall be applied at a temperature of less than 200°F (93°C).					
RB176-19	**SECTION R408** **UNDER-FLOOR SPACE** **R408.1 ~~Ventilation.~~ Moisture Control.** The under-floor space between the bottom of the floor joists and the earth under any building (except space occupied by a *basement*) shall ~~have ventilation openings through foundation walls or exterior walls. The minimum net area of ventilation openings shall be not less than 1 square foot (0.0929 m^2) for each 150 square feet (14 m^2) of under-floor space area, unless the ground surface is covered by a Class 1 vapor retarder material. Where a Class 1 vapor retarder material is used, the minimum net area of ventilation openings shall be not less than 1 square foot (0.0929 m^2) for each 1,500 square feet (140 m^2) of under-floor space area. One such ventilating opening shall be within 3 feet (914 mm) of each corner of the~~ building comply with Section R408.2 or Section R408.3. **R408.2 Openings for under-floor ventilation.** Ventilation openings through foundation or exterior walls surrounding the under-floor space shall be provided in accordance with this section. The minimum net area of ventilation openings shall be not less than 1 square foot (0.0929 m^2)		X			Clarification

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		Decrease	None	Increase		
Sub Code:						
	for each 150 square feet (14 m^2) of under-floor area. One ventilation opening shall be within 3 feet (915 mm) of each external corner of the ~~building.~~ under-floor space. Ventilation openings shall be covered for their height and width with any of the following materials provided that the least dimension of the covering shall not exceed $^1/_4$ inch (6.4 mm), and operational louvers are permitted: 1. Perforated sheet metal plates not less than 0.070 inch (1.8 mm) thick. 2. Expanded sheet metal plates not less than 0.047 inch (1.2 mm) thick. 3. Cast-iron grill or grating. 4. Extruded load-bearing brick vents. 5. Hardware cloth of 0.035 inch (0.89 mm) wire or heavier. 6. Corrosion-resistant wire mesh, with the least dimension being $^1/_8$ inch (3.2 mm) thick. ~~**Exception**~~ **Exceptions:** 1. The total area of ventilation openings shall be permitted to be reduced to $^1/_{1,500}$ of the under-floor area where the ground surface is covered with an *approved* Class I vapor retarder material ~~and the required openings are placed to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited.~~ 2. Where the ground surface is covered with an approved class 1 vapor retarder material, ventilation openings are not required to be within 3 feet (915 mm) of each external corner of the under-floor space provided the openings are placed to provide cross ventilation of the space. **R408.3 Unvented crawl space.** ~~Ventilation openings in~~ For unvented under-floor spaces ~~specified in Sections R408.1 and R408.2 shall not be required where~~ the following items ~~are~~ shall be provided: 1. Exposed earth ~~is~~ shall be covered with a continuous Class I vapor retarder. Joints of the vapor retarder shall overlap by 6 inches (152 mm) and shall be sealed or taped. The edges of the vapor retarder shall extend not less than 6 inches (152 mm) up the stem wall and shall be attached and sealed to the stem wall or insulation. 2. One of the following ~~is~~ shall be provided for the under-floor space: 2.1. Continuously operated mechanical exhaust ventilation at a rate equal to 1 cubic foot per minute (0.47 L/s) for each 50 square feet (4.7 m2) of crawl space floor area, including an air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.11 of this code. 2.2. Conditioned air supply sized to deliver at a rate equal to 1 cubic foot per minute (0.47 L/s) for each 50 square feet (4.7 m2) of under-floor area, including a return air pathway to the					

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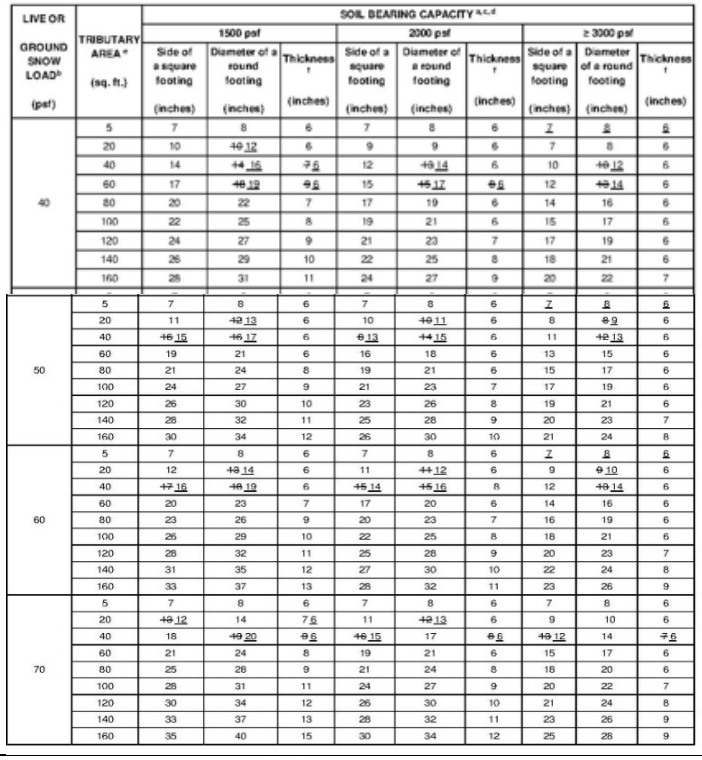
Sub Code:						
	common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.11 of this code. 2.3. Plenum in existing structures complying with Section M1601.5, if under-floor space is used as a plenum. 2.4. Dehumidification sized to provide 70 pints (33 liters) of moisture removal per day for every 1,000 square feet (93 m2) of crawl space floor area.					
RB179-19	In 2012, full-scale testing of visually-graded southern pine lumber was underway and preliminary results indicated that some changes to visually-graded southern pine design values would be required. Unfortunately, the testing and certification of design values were not going to be completed in time to submit new design tables to the 2015 IRC, if required. Several 2012 IRC tables, which had been based on minimum design values for No. 2 grade Hem-Fir or SPF lumber, also applied to No. 2 grade southern pine. As an interim recommendation until new design values could be certified, a sentence was added to those tables restricting the applicability to No.1 grade or better southern pine lumber. Since that time, new design values for southern pine have been certified. Bending design values for No. 2 grade southern pine are slightly less than No. 2 grade Hem-Fir lumber, but Modulus of Elasticity (MOE) and shear design values are higher than those for Hem-Fir. Analysis of the tabulated cantilever spans in Tables R502.3.3(1) and R502.3.3(2) has confirmed that the spans were deflection-controlled based on the MOE of No. 2 grade of Hem-Fir lumber. Since No. 2 grade southern pine lumber has a higher MOE value than No. 2 grade Hem-Fir lumber, there is no need for the added sentence at the end of footnote "b" in Table R502.3.3(1) and at the end of footnote "a" in Table R502.3.3(2) restricting the applicability to No. 1 or better southern pine lumber.	X			Difference between #1 and #2 KD Southern Pine	Updates footnotes for Southern Pine
RB180-19	**R505.1.1.1 Alternate Applications.** Cold-formed steel floor framing for buildings exceeding the applicability limits of Section R505.1.1 are permitted to be designed and constructed in accordance with AISI S230, subject to the limits therein. **R603.1.1.1 Alternate Applications.** Cold-formed steel wall framing for buildings exceeding the applicability limits of Section R603.1.1 are permitted to be designed and constructed in accordance with AISI S230, subject to the limits therein. **R804.1.1.1 Alternate Applications.** Cold-formed steel roof and ceiling framing for buildings exceeding the applicability limits of Section R804.1.1 are permitted to be designed and constructed in accordance with AISI S230, subject to the limits therein.		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RB181-19	**R505.1.3 Floor trusses.** Cold-formed steel trusses shall be designed, braced and installed in accordance with AISI S230 Section D8. In absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practices, such as the SBCA *Cold-Formed Steel Building Component Safety Information (CFSBCSI), Guide to Good Practice for Handling, Installing & Bracing of Cold-Formed Steel Trusses*. Truss members shall not be notched, cut or altered in any manner without an *approved* design. **R804.3.6 Roof trusses.** Cold-formed steel trusses shall be designed and installed in accordance with AISI S230 Section F6. In absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practices, such as the SBCA *Cold-Formed Steel Building Component Safety Information (CFSBCSI), Guide to Good Practice for Handling, Installing & Bracing of Cold-Formed Steel Trusses*. Trusses shall be connected to the top track of the load-bearing wall in accordance with Table R804.3, either with the required number of No. 10 screws applied through the flange of the truss or by using a 54-mil (1.37 mm) clip angle with the required number of No. 10 screws in each leg.		X			Clarification
RB184-19	**TABLE R507.3.1** **MINIMUM FOOTING SIZE FOR DECKS** 		X			Clarification

LIVE OR GROUND SNOW LOAD[b] (psf)	TRIBUTARY AREA[e] (sq. ft.)	SOIL BEARING CAPACITY[a,c,d] 1500 psf			2000 psf			≥ 3000 psf		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness[f] (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness[f] (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness[f] (inches)
40	5	7	8	6	7	8	6	7	8	6
	20	10	~~10~~ 12	6	9	9	6	7	8	6
	40	14	~~14~~ 16	~~7~~ 6	12	~~13~~ 14	6	10	~~10~~ 12	6
	60	17	~~18~~ 19	~~9~~ 6	15	~~15~~ 17	~~8~~ 6	12	~~13~~ 14	6
	80	20	22	7	17	19	6	14	16	6
	100	22	25	8	19	21	6	15	17	6
	120	24	27	9	21	23	7	17	19	6
	140	26	29	10	22	25	8	18	21	6
	160	28	31	11	24	27	9	20	22	7
50	5	7	8	6	7	8	6	7	8	6
	20	11	~~12~~ 13	6	10	~~10~~ 11	6	8	~~8~~ 9	6
	40	~~16~~ 16	~~16~~ 17	6	~~8~~ 13	~~14~~ 15	6	11	~~12~~ 13	6
	60	19	21	6	16	18	6	13	15	6
	80	21	24	8	19	21	6	15	17	6
	100	24	27	9	21	23	7	17	19	6
	120	26	30	10	23	26	8	19	21	6
	140	28	32	11	25	28	9	20	23	7
	160	30	34	12	26	30	10	21	24	8
60	5	7	8	6	7	8	6	7	8	6
	20	12	~~13~~ 14	6	11	~~11~~ 12	6	9	~~9~~ 10	6
	40	~~17~~ 16	~~18~~ 19	6	~~15~~ 14	~~15~~ 16	8	12	~~13~~ 14	6
	60	20	23	7	17	20	6	14	16	6
	80	23	26	9	20	23	7	16	19	6
	100	26	29	10	22	25	8	18	21	6
	120	28	32	11	25	28	9	20	23	7
	140	31	35	12	27	30	10	22	24	8
	160	33	37	13	28	32	11	23	26	9
70	5	7	8	6	7	8	6	7	8	6
	20	~~13~~ 12	14	~~7~~ 6	11	~~12~~ 13	6	9	10	6
	40	18	~~19~~ 20	~~9~~ 6	~~16~~ 15	17	~~8~~ 6	~~13~~ 12	14	~~7~~ 6
	60	21	24	8	19	21	6	15	17	6
	80	25	28	9	21	24	8	18	20	6
	100	28	31	11	24	27	9	20	22	7
	120	30	34	12	26	30	10	21	24	8
	140	33	37	13	28	32	11	23	26	9
	160	35	40	15	30	34	12	25	28	9

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	Sub Code:					

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m^2, 1 pound per square foot = 0.0479 kPa.

a. Interpolation permitted, extrapolation not permitted.
b. Based on highest load case: Dead + Live or Dead + Snow.
c. Footing dimensions shall allow complete bearing of the post.
d. If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides.
e. Area, in square feet, of deck surface supported by post and footings.
f. Minimum thickness shall only apply to plain concrete footings.

R507.4 Deck posts. For single-level decks, wood ~~deck~~ post size shall be in accordance with Table R507.4.

TABLE R507.4
DECK POST HEIGHT

Portions of table not shown remain unchanged.

LOADS [b] (psf)	POST SPECIES [c]	POST SIZE [d]	~~TRIBUTARY AREA [a,b] (sqft)~~ MAXIMUM DECK POST HEIGHT [a] (feet-inches) Tributary Area [a,e] (sqft)							
			20	40	60	80	100	120	140	160
40 Live Load	Southern Pine	4 x 4	14-0	13-8	11-0	9-5	8-4	7-5	6-9	6-2
		4 x 6	14-0	14-0	13-11	12-0	10-8	9-8	8-10	8-2
		6 x 6	14-0	14-0	~~11-0~~ 14-0	14-0	14-0	14-0	14-0	14-0
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Douglas Fir [e], Hem-fir [e], SPF [e]	4 x 4	14-0	13-6	10-10	9-3	8-0	7-0	6-2	5-3
		4 x 6	14-0	14-0	13-10	11-10	10-6	9-5	8-7	7-10
		6 x 6	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood [f], Western Cedars [f], Ponderosa Pine [f], Red Pine [f]	4 x 4	14-0	~~12-1~~ 13-2	~~9-8~~ 10-3	~~8-02~~ 8-1	~~7-1~~ 5-8	~~6-2~~ NP	~~5-8~~ NP	~~4-2~~ NP
		4 x 6	14-0	14-0	~~12-4~~ 13-6	~~10-7~~ 11-4	~~9-4~~ 9-9	8-4	~~7-7~~ 6-9	~~6-11~~ 4-7
		6 x 6	14-0	14-0	14-0	14-0	14-0	14-0	~~14-0~~ 13-7	~~12-10~~ 9-7
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
50 Ground Snow Load	Southern Pine	4 x 4	14-0	12-2	9-10	8-5	7-5	~~9-7~~ 6-7	5-11	5-4
		4 x 6	14-0	14-0	12-6	10-9	9-6	8-7	7-10	7-3
		6 x 6	14-0	14-0	14-0	14-0	14-0	14-0	14-0	13-4
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Douglas Fir [e], Hem-fir [e], SPF [e]	4 x 4	14-0	12-1	9-8	8-2	7-1	6-2	5-3	4-2
		4 x 6	14-0	14-0	12-4	10-7	9-4	8-4	7-7	6-11
		6 x 6	14-0	14-0	14-0	14-0	14-0	14-0	14-0	12-10
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood [f], Western Cedars [f], Ponderosa Pine [f], Red Pine [f]	4 x 4	14-0	11-8	9-0	6-10	3-7	NP	NP	NP
		4 x 6	14-0	14-0	12-0	10-0	8-6	7-0	5-3	NP
		6 x 6	14-0	14-0	14-0	14-0	14-0	14-0	10-8	2-4
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Southern Pine	4 x 4	14-0	11-1	8-11	7-7	6-7	5-10	5-2	4-6
		4 x 6	14-0	14-0	11-4	9-9	8-7	7-9	7-1	6-6
		6 x 6	14-0	14-0	14-0	14-0	14-0	14-0	12-9	11-2
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact					
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						

	Douglas Fir [e],	4 x 4	14-0	10-11	8-8	7-3	6-2	5-0	3-7	NP
		4 x 6	14-0	13-11	~~11-2~~ 11-2	9-7	8-4	7-5	6-8	5-11
60	Hem-fir [e],	6 x 6	14-0	14-0	14-0	14-0	14-0	14-0	12-2	10-2
Ground	SPF [e]	8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
Snow										
Load	Redwood [f],	4 x 4	14-0	10-6	7-9	4-7	NP	NP	NP	NP
		4 x 6	14-0	13-7	10-9	8-9	7-0	4-9	NP	NP
	Western Cedars [f],	6 x 6	14-0	14-0	14-0	14-0	14-0	9-9	NP	NP
	Ponderosa Pine [f],	8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Red Pine [f]									
		4 x 4	14-0	10-2	8-2	6-11	5-11	5-2	4-4	3-4
	Southern Pine	4 x 6	14-0	12-11	10-5	8-11	7-10	7-1	6-5	5-10
		6 x 6	14-0	14-0	14-0	14-0	14-0	12-9	10-11	8-7
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Douglas Fir [e],	4 x 4	14-0	10-1	7-11	6-6	5-3	3-7	NP	NP
		4 x 6	14-0	12-10	10-3	8-9	7-7	6-8	5-10	4-11
70	Hem-fir [e],	6 x 6	14-0	14-0	14-0	14-0	14-0	12-2	9-9	5-9
Ground	SPF [e]	8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
Snow										
Load	Redwood [f],	4 x 4	14-0	9-5	6-5	NP	NP	NP	NP	NP
		4 x 6	14-0	12-6	9-8	7-7	5-3	NP	NP	NP
	Western Cedars [f],	6 x 6	14-0	14-0	14-0	14-0	10-8	NP	NP	NP
	Ponderosa Pine [f],	8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Red Pine [f]									

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa., NP = Not Permitted

a. Measured from the underside of the beam to top of footing or pier.

b. 10 psf dead load. Snow load not assumed to be concurrent with live load.

c. No. 2 grade, wet service factor included.

d. Notched deck posts shall be sized to accommodate beam size per in accordance with Section R507.5.2

e. Includes incising factor.

f. Incising factor not included.

g. Area, in square feet, of deck surface supported by post and footings.

h. Interpolation permitted. Extrapolation not permitted.

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						

TABLE R507.5(1)
MAXIMUM DECK BEAM SPAN - 40 PSF LIVE LOAD [c]

BEAM SPECIES [d]	BEAM SIZE [e]	~~DECK JOIST SPAN [a,i] (feet)~~ MAXIMUM BEAM SPAN [a,b,f] (feet-inches) Deck Joist Span [a,i] (feet)						
		6	8	10	12	14	16	18
Southern Pine	1 – 2 x 6	4-7	4-0	3-7	3-3	3-0	2-10	~~2-7~~ 2-8
	1 – 2 x 8	~~5-10~~ 5-11	5-1	~~4-6~~ 4-7	~~4-1~~ 4-2	3-10	3-7	~~3-4~~ 3-5
	1 – 2 x 10	~~6-11~~ 7-0	6-0	~~5-4~~ 5-5	4-11	~~4-6~~ 4-7	4-3	4-0
	1 – 2 x 12	~~8-2~~ 8-3	7-1	6-4	~~5-9~~ 5-10	~~5-4~~ 5-5	5-0	~~4-8~~ 4-9
	2 – 2 x 6	~~6-10~~ 6-11	5-11	~~5-8~~ 5-4	4-10	4-6	~~4-2~~ 4-3	~~3-11~~ 4-0
	2 – 2 x 8	~~8-8~~ 8-9	~~7-6~~ 7-7	6-9	6-2	~~5-8~~ 5-9	5-4	5-0
	2 – 2 x 10	10-4	~~8-11~~ 9-0	8-0	~~7-9~~ 7-4	6-9	6-4	~~5-11~~ 6-0
	2 – 2 x 12	12-2	~~10-5~~ 10-7	9-5	8-7	~~7-11~~ 8-0	7-5	7-0
	3 – 2 x 6	8-6	7-5	6-8	6-1	~~5-7~~ 5-8	5-3	4-11
	3 – 2 x 8	10-11	~~9-5~~ 9-6	~~8-5~~ 8-6	~~7-8~~ 7-9	~~7-1~~ 7-2	6-8	~~6-3~~ 6-4
	3 – 2 x 10	~~12-11~~ 13-0	11-2	10-0	~~9-1~~ 9-2	~~8-5~~ 8-6	7-11	~~7-5~~ 7-6
	3 – 2 x 12	15-3	~~13-2~~ 13-3	~~11-9~~ 11-10	10-9	~~9-11~~ 10-0	9-4	~~8-9~~ 8-10
Douglas fir-larch [g], Hem-fir [g], Spruce-pine-fir [g]	1– 2 x 6	4-1	3-6	3-0	~~2-6~~ 2-8	~~2-1~~ 2-5	~~1-10~~ 2-3	~~1-7~~ 2-1
	1– 2 x 8	5-6	~~4-9~~ 4-8	4-0	~~3-8~~ 3-6	~~2-9~~ 3-2	~~2-5~~ 2-11	~~2-1~~ 2-9
	1– 2 x 10	6-8	5-10	5-1	~~4-2~~ 4-6	~~3-6~~ 4-1	~~3-1~~ 3-9	~~2-8~~ 3-6
	1– 2 x 12	7-9	6-9	6-0	~~5-1~~ 5-6	~~4-4~~ 5-0	3-9	~~3-3~~ 3-6
	2-2 x 6	6-1	5-3	4-9	4-4	~~4-0~~ 3-11	~~3-8~~ 3-7	3-3
	2-2 x 8	8-2	7-1	6-4	5-9	~~5-4~~ 5-2	~~4-10~~ 4-8	~~4-3~~ 4-4
	2-2 x 10	10-0	8-7	7-9	7-0	6-6	~~6-1~~ 6-0	~~5-5~~ 5-6
	2-2 x 12	11-7	10-0	8-11	8-2	7-7	7-1	~~6-7~~ 6-8
	3 – 2 x 6	7-8	~~6-7~~ 6-8	~~5-11~~ 6-0	~~5-5~~ 5-6	~~5-0~~ 5-1	~~4-8~~ 4-9	~~4-5~~ 4-6
	3 – 2 x 8	10-3	8-10	7-11	7-3	6-8	6-3	5-11
	3 – 2 x 10	12-6	10-10	9-8	8-10	8-2	7-8	7-2
	3 – 2 x 12	14-6	12-7	11-3	10-3	9-6	8-11	8-5
Redwood [h], Western Cedars [h], Ponderosa Pine [h], Red Pine [h]	1 - 2 x 6	4-2	3-7	3-1	~~2-7~~ 2-9	~~2-2~~ 2-6	~~1-10~~ 2-3	~~1-8~~ 2-2
	1 - 2 x 8	5-4	4-7	4-1	~~3-4~~ 3-7	~~2-10~~ 3-3	~~2-6~~ 3-0	~~2-2~~ 2-10
	1 - 2 x 10	6-6	5-7	5-0	~~4-3~~ 4-7	~~3-8~~ 4-2	~~3-2~~ 3-10	~~2-9~~ 3-7
	1 - 2 x 12	7-6	6-6	5-10	~~5-3~~ 5-4	~~4-5~~ 4-11	~~3-10~~ 4-7	~~3-5~~ 4-4
	2 - 2 x 6	6-2	5-4	4-10	4-5	~~4-1~~ 4-0	~~3-9~~ 3-8	3-4
	2 - 2 x 8	7-10	6-10	6-1	5-7	5-2	4-10	~~4-4~~ 4-5
	2 - 2 x10	9-7	8-4	7-5	6-9	6-3	5-10	5-6
	2 - 2 x 12	11-1	9-8	8-7	7-10	7-3	6-10	6-5
	3 - 2 x 6	7-8	6-9	6-0	5-6	5-1	4-9	4-6
	3 - 2 x 8	9-10	8-6	7-7	6-11	6-5	6-0	5-8
	3 - 2 x 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3 - 2 x 12	13-11	12-1	10-9	9-10	9-1	8-6	8-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

a. Interpolation permitted. Extrapolation not permitted.

b. Beams supporting a single span of joists with or without cantilever.

c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever Snow load not assumed to be concurrent with live load.

d. No. 2 grade, wet service factor included.

e. Beam depth shall be equal to or greater than the depth intersecting joist for a flush beam connection.

f. Beam cantilevers are limited to the adjacent beam's span/4

g. Includes incising factor.

h. Incising factor not included.

i. Deck joist span as shown in Figure R507.5

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact							
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						

TABLE R507.5(2)
MAXIMUM DECK BEAM SPAN - 50 PSF GROUND SNOW LOAD [c]

BEAM SPECIES [d]	BEAM SIZE [e]	DECK JOIST SPAN [a,j] / MAXIMUM BEAM SPAN [a,b,j] (feet-inches) — Deck Joist Span [a,j] (feet)						
		6	8	10	12	14	16	18
Southern Pine	1-2x6	4-2 4-6	3-8 3-11	3-3 3-6	2-11 3-2	2-9 2-11	2-5 2-9	2-2 2-7
	1-2x8	5-4 5-9	4-7 4-11	4-1 4-5	3-9 4-0	3-6 3-9	3-3 3-6	2-10 3-3
	1-2x10	6-4 6-9	5-6 5-10	4-11 5-3	4-6 4-9	4-2 4-5	3-10 4-2	3-6 3-11
	1-2x12	7-6 8-0	6-5 6-11	5-9 6-2	5-3 5-8	4-10 5-3	4-7 4-11	4-3 4-7
	2-2x6	6-0 6-8	5-5 5-9	4-10 5-2	4-5 4-9	4-1 4-4	3-10 4-1	3-7 3-10
	2-2x8	7-11 8-6	6-10 7-4	6-2 6-7	5-7 6-0	5-2 5-7	4-10 5-2	4-7 4-11
	2-2x10	9-5 10-1	8-2 8-9	7-3 7-10	6-8 7-1	6-2 6-7	5-9 6-2	5-5 5-10
	2-2x12	11-1 11-11	9-7 10-3	8-7 9-2	7-10 8-5	7-3 7-9	6-9 7-3	6-5 6-10
	3-2x6	7-10 7-11	6-9 7-2	6-1 6-6	5-6 5-11	5-1 5-6	4-9 5-1	4-6 4-10
	3-2x8	9-11 10-5	8-7 9-3	7-8 8-3	7-0 7-6	6-6 6-11	6-16 6-6	5-9 6-2
	3-2x10	11-9 12-8	10-2 10-11	9-1 9-9	8-4 8-11	7-8 8-3	7-2 7-9	6-9 7-3
	3-2x12	13-11 14-11	12-0 12-11	10-9 11-6	9-10 10-6	9-1 9-9	8-6 9-1	8-0 8-7
Douglas fir-larch [g], Hem-fir [g], Spruce-pine-fir [g]	1-2x6	3-0 4-0	3-3 3-5	2-6 2-11	2-1 2-7	1-10 2-4	1-6 2-2	1-4 2-0
	1-2x8	5-0 5-4	4-0 4-7	3-4 3-11	2-9 3-5	2-3 3-1	2-0 2-10	1-9 2-8
	1-2x10	6-1 6-7	5-4 5-8	4-8 4-11	3-6 4-5	2-11 4-0	2-6 3-8	2-3 3-5
	1-2x12	7-1 7-7	6-2 6-7	5-3 5-11	4-8 5-4	3-7 4-10	3-1 4-6	2-9 4-2
	2-2x6	5-7 6-0	4-10 5-2	4-4 4-7	3-11 4-2	3-6 3-10	3-3 3-5	2-8 3-2
	2-2x8	7-5 8-0	6-5 6-11	5-9 6-2	5-3 5-8	4-7 5-0	4-0 4-7	3-6 4-2
	2-2x10	9-1 9-9	7-10 8-5	7-0 7-7	6-5 6-11	5-11 6-4	5-1 5-10	4-6 5-4
	2-2x12	10-7 11-4	9-2 9-10	8-2 8-9	7-5 8-0	6-11 7-5	6-6 6-11	5-6 6-6
	3-2x6	7-0 7-6	6-0 6-6	5-5 5-9	4-11 5-3	4-7 4-11	4-0 4-7	4-0 4-4
	3-2x8	9-4 10-0	8-1 8-8	7-3 7-9	6-7 7-1	6-1 6-6	5-8 6-1	5-4 5-8
	3-2x10	11-5 12-3	9-10 10-7	8-10 9-6	8-1 8-8	7-5 8-0	7-0 7-6	6-7 7-0
	3-2x12	13-9 14-3	11-6 12-4	10-9 11-0	9-5 10-1	8-9 9-4	8-1 8-9	7-8 8-3
Redwood [h], Western Cedars [h], Ponderosa Pine [h], Red Pine [h]	1-2x6	3-10 4-1	3-4 3-6	2-7 3-0	2-2 2-8	1-10 2-5	1-7 2-3	1-5 2-1
	1-2x8	4-10 5-2	4-2 4-6	3-5 4-0	2-10 3-6	2-4 3-2	2-1 2-11	1-10 2-9
	1-2x10	5-11 6-4	5-1 5-6	4-4 4-11	3-7 4-6	3-0 4-1	2-8 3-9	2-4 3-6
	1-2x12	6-10 7-4	5-11 6-4	5-4 5-8	4-4 5-2	3-8 4-10	3-2 4-6	2-10 4-3
	2-2x6	5-0 6-1	4-11 5-3	4-5 4-8	4-0 4-4	3-7 3-11	3-1 3-6	2-9 3-3
	2-2x8	7-2 7-8	6-3 6-8	5-7 5-11	5-1 5-5	4-8 5-0	4-1 4-8	3-8 4-3
	2-2x10	8-9 9-5	7-7 8-2	6-9 7-3	6-2 6-8	5-9 6-2	5-3 5-9	4-8 5-5
	2-2x12	10-2 10-11	8-10 9-5	7-10 8-5	7-2 7-8	6-8 7-2	6-3 6-8	5-8 6-3
	3-2x6	7-1	6-2 6-5	5-6 5-11	5-0 5-5	4-8 5-0	4-4 4-8	4-1 4-5
	3-2x8	9-0 9-4	7-9 8-4	6-11 7-5	6-4 6-10	5-11 6-4	5-6 5-11	5-2 5-7
	3-2x10	11-0 11-9	9-6 10-2	8-6 9-1	7-9 8-4	7-2 7-8	6-9 7-2	6-4 6-9
	3-2x12	12-9 13-8	11-0 11-10	9-10 10-7	9-0 9-8	8-4 8-11	7-9 8-4	7-4 7-10

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.
a. Interpolation allowed. Extrapolation is not allowed.
b. Beams supporting a single span of joists with or without cantilever.
c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.
d. No. 2 grade, wet service factor included.
e. Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						

f. Beam cantilevers are limited to the adjacent beam's span/4.
g. Includes incising factor
h. Incising factor not included.
i. Deck joist span as shown in Figure R507.5

TABLE R507.5(3)
MAXIMUM DECK BEAM SPAN - 60 PSF GROUND SNOW LOAD [c]

Portions of table not shown remain unchanged.

BEAM SPECIES [d]	BEAM SIZE [e]	DECK JOIST SPAN [a, b] (feet) — MAXIMUM BEAM SPAN [a,b,i] (feet-inches) — Deck Joist Span [a] (feet)					
		6	8	10	12	14	16	18
Southern Pine	1-2x6	8-11	4-2	3-4	3-7	3-0	3-3	3-0	2-11	2-5	2-9	2-1	2-6	1-10	2-5
	1-2x8	11-1	5-3	4-0	4-7	3-10	4-1	3-6	3-9	3-0	3-5	2-8	3-3	2-5	3-0
	1-2x10	14-10	6-3	5-1	5-5	4-8	4-10	4-2	4-5	3-10	4-1	3-6	3-10	3-1	3-7
	1-2x10	16-11	7-5	6-0	6-5	5-4	5-9	4-10	5-3	4-6	4-10	4-2	4-6	3-10	4-3
	2-2x6	8-0	6-2	5-0	5-4	4-6	4-9	4-1	4-4	3-9	4-0	3-6	3-9	3-4	3-7
	2-2x8	10-7	7-10	6-4	6-10	5-8	6-1	5-2	5-7	4-9	5-2	4-6	4-10	4-3	4-6
	2-2x10	13-8	9-4	7-6	8-1	6-9	7-3	6-2	6-7	5-8	6-1	5-4	5-8	5-0	5-4
	2-2x12	16-8	11-0	8-11	9-6	7-11	8-6	7-3	7-9	6-8	7-2	6-3	6-9	5-11	6-4
	3-2x6	10-7	7-5	6-0	6-9	5-7	6-0	5-1	5-6	4-9	5-1	4-5	4-9	4-2	4-6
	3-2x8	13-9	9-9	7-11	8-6	7-1	7-8	6-6	6-11	6-0	6-5	5-7	6-0	5-3	5-8
	3-2x10	16-11	11-6	9-5	10-2	8-5	9-1	7-8	8-3	7-0	7-8	6-8	7-2	6-3	6-9
	3-2x12	16-10	13-9	11-2	11-11	9-11	10-8	9-1	9-9	8-5	9-0	7-10	8-5	7-5	7-11
Douglas fir-larch [g], Hem-fir [g], Spruce pine-fir [g]	1-2x6	8-5	3-8	3-0	3-1	2-9	2-8	2-6	2-4	2-2	2-2	1-9	2-0	1-4	1-10
	1-2x8	10-8	5-0	3-8	4-1	3-4	3-6	3-2	3-1	2-11	2-10	2-6	2-7	1-6	2-5
	1-2x10	13-6	6-1	4-8	5-2	4-3	4-6	4-0	4-0	3-6	3-7	3-2	3-4	2-11	3-2
	1-2x12	16-7	7-1	5-8	6-1	5-0	5-5	4-8	4-10	4-3	4-5	3-10	4-1	3-7	3-10
	2-2x6	8-0	5-5	4-5	4-9	4-0	4-3	3-9	3-10	3-5	3-5	3-1	3-1	2-8	2-10
	2-2x8	10-6	7-5	5-11	6-5	5-4	5-9	4-8	5-0	4-4	4-6	3-11	4-1	3-5	3-9
	2-2x10	13-4	9-0	7-3	7-10	6-6	7-0	5-11	6-4	5-5	5-9	4-8	5-2	4-4	4-10
	2-2x12	16-1	10-6	8-5	9-1	7-7	8-1	6-11	7-5	6-4	6-10	5-7	6-4	5-3	5-10
	3-2x6	10-6	6-11	5-7	6-0	5-0	5-4	4-7	4-11	4-3	4-6	3-11	4-2	3-5	3-10
	3-2x8	13-8	9-3	7-6	8-0	6-8	7-2	6-1	6-6	5-8	6-1	5-0	5-6	4-7	5-0
	3-2x10	16-7	11-4	9-2	9-10	8-2	8-9	7-5	8-0	6-11	7-5	6-5	6-11	5-10	6-5
	3-2x12	16-8	13-2	10-8	11-5	9-6	10-2	8-8	9-4	8-0	8-7	7-6	8-1	6-11	7-7
Redwood [h], Western Cedars [h], Ponderosa Pine [h], Red Pine [h]	1- 2x6	8-3	3-9	3-0	3-2	2-10	2-9	2-7	2-5	2-2	2-2	1-9	2-0	1-3	1-11
	1- 2x8	10-9	4-10	3-9	4-2	3-4	3-7	3-2	3-2	2-9	2-11	2-5	2-8	1-7	2-6
	1- 2x10	13-8	5-10	4-8	5-1	4-2	4-6	3-11	4-1	3-6	3-8	3-1	3-5	2-8	3-3
	1- 2x12	16-8	6-10	5-5	5-11	4-7	5-3	4-5	4-10	4-1	4-5	3-6	4-2	3-1	3-11
	2- 2x6	8-0	5-7	4-6	4-10	4-1	4-4	3-11	4-1	3-6	3-6	3-2	3-2	2-8	2-11
	2- 2x8	10-6	7-1	5-8	6-2	5-2	5-6	4-8	5-0	4-4	4-7	3-10	4-2	3-3	3-10
	2- 2x10	13-4	8-8	7-0	7-6	6-0	6-9	5-9	6-2	5-3	5-8	4-8	5-4	4-0	4-11
	2- 2x12	16-1	10-1	8-2	8-9	7-0	7-10	6-8	7-2	6-2	6-7	5-6	6-2	4-10	5-10
	3- 2x6	10-6	6-6	5-6	6-1	5-1	5-5	4-8	5-0	4-4	4-7	4-0	4-3	3-7	3-11
	3- 2x8	13-8	8-4	7-0	7-9	6-5	6-11	5-11	6-4	5-5	5-10	5-1	5-5	4-8	5-2
	3- 2x10	16-8	10-11	8-10	9-5	7-10	8-5	7-2	7-8	6-7	7-2	6-3	6-8	5-10	6-3
	3- 2x12	16-8	12-8	10-2	10-11	9-1	9-9	8-4	8-11	7-8	8-3	7-3	7-9	6-10	7-3

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

a. Interpolation allowed. Extrapolation is not allowed.

b. Beams supporting a single span of joists with or without cantilever.

c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.

d. No. 2 grade, wet service factor included.

e. Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.

f. Beam cantilevers are limited to the adjacent beam's span divided by 4.

g. Includes incising factor

h. Incising factor not included.

i. Deck joist span as shown in Figure R507.5

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						

TABLE R507.5(4)
MAXIMUM DECK BEAM SPAN - 70 PSF GROUND SNOW LOAD [c]

BEAM SPECIES [d]	BEAM SIZE [e]	~~DECK JOIST SPAN (feet) [a,i]~~ MAXIMUM BEAM SPAN [a,b,f] (feet-inches) Deck Joist Span [a,i] (feet)						
		5	6	10	12	14	16	16
Southern Pine	1-2x6	~~3 6~~ 3-11	~~3 2~~ 3-4	~~2 10~~ 3-0	~~2 1~~ 2-9	~~1 10~~ 2-6	~~1 4~~ 2-4	~~1 7~~ 2-3
	1-2x8	~~4 7~~ 4-11	~~4 0~~ 4-3	~~3 7~~ 3-10	~~3 0~~ 3-6	~~2 9~~ 3-3	~~2 5~~ 3-0	~~2 2~~ 2-10
	1-2x10	~~5 6~~ 5-10	~~4 9~~ 5-1	~~4 0~~ 4-6	~~3 10~~ 4-2	~~3 7~~ 3-10	~~3 1~~ 3-7	~~2 9~~ 3-4
	1-2x12	~~6 5~~ 6-11	~~5 7~~ 6-0	~~5 0~~ 5-4	~~4 7~~ 4-11	~~4 0~~ 4-6	~~3 9~~ 4-3	~~3 4~~ 4-0
	2-2x6	~~5 5~~ 5-9	~~4 8~~ 5-0	~~4 2~~ 4-6	~~3 10~~ 4-1	~~3 6~~ 3-9	~~3 3~~ 3-6	~~3 1~~ 3-4
	2-2x8	~~6 10~~ 7-4	~~5 11~~ 6-4	~~5 4~~ 5-8	~~4 10~~ 5-2	~~4 6~~ 4-10	~~4 2~~ 4-6	~~3 11~~ 4-3
	2-2x10	~~8 2~~ 8-9	~~7 1~~ 7-7	~~6 4~~ 6-9	~~5 9~~ 6-2	~~5 4~~ 5-8	~~5 0~~ 5-4	~~4 8~~ 5-0
	2-2x12	~~9 7~~ 10-3	~~8 4~~ 8-11	~~7 5~~ 8-0	~~6 9~~ 7-3	~~6 3~~ 6-9	~~5 10~~ 6-3	~~5 6~~ 5-11
	3-2x6	~~6 6~~ 7-0	~~5 10~~ 6-3	~~5 3~~ 5-7	~~4 9~~ 5-1	~~4 5~~ 4-9	~~4 2~~ 4-5	~~3 11~~ 4-2
	3-2x8	~~8 7~~ 9-3	~~7 5~~ 8-0	~~6 8~~ 7-2	~~6 1~~ 6-6	~~5 7~~ 6-0	~~5 3~~ 5-8	~~4 11~~ 5-4
	3-2x10	~~10 2~~ 10-11	~~9 10~~ 9-6	~~7 11~~ 8-6	~~7 2~~ 7-9	~~6 8~~ 7-2	~~6 3~~ 6-8	~~5 10~~ 6-4
	3-2x12	~~12 0~~ 12-11	~~10 5~~ 11-2	~~9 4~~ 10-0	~~8 6~~ 9-1	~~7 10~~ 8-5	~~7 4~~ 7-11	~~6 11~~ 7-5
Douglas fir-larch [g], Hem-fir [g], Spruce-pine-fir [g]	1-2x6	~~3 3~~ 3-5	~~2 5~~ 2-10	~~1 10~~ 2-5	~~1 6~~ 2-2	~~1 3~~ 2-0	~~1 1~~ 1-10	~~1 0~~ 1-9
	1-2x8	~~4 4~~ 4-7	~~3 3~~ 3-8	~~2 6~~ 3-2	~~2 0~~ 2-10	~~1 8~~ 2-7	~~1 6~~ 2-5	~~1 4~~ 2-4
	1-2x10	~~5 4~~ 5-8	~~4 1~~ 4-9	~~3 2~~ 4-1	~~2 7~~ 3-8	~~2 3~~ 3-4	~~1 11~~ 3-1	~~1 8~~ 2-11
	1-2x12	~~6 2~~ 6-7	~~5 0~~ 5-8	~~3 10~~ 5-0	~~3 2~~ 4-6	~~2 8~~ 4-1	~~2 4~~ 3-10	~~2 0~~ 3-7
	2-2x6	~~4 10~~ 5-2	~~4 0~~ 4-6	~~3 0~~ 4-0	~~3 1~~ 3-5	~~2 7~~ 3-1	~~2 2~~ 2-10	~~2 0~~ 2-7
	2-2x8	~~6 5~~ 6-11	~~5 7~~ 6-0	~~5 0~~ 5-3	~~4 1~~ 4-7	~~3 5~~ 4-1	~~3 0~~ 3-8	~~2 8~~ 3-5
	2-2x10	~~7 10~~ 8-5	~~6 10~~ 7-4	~~6 1~~ 6-6	~~5 3~~ 5-10	~~4 5~~ 5-2	~~3 10~~ 4-9	~~3 5~~ 4-5
	2-2x12	~~9 2~~ 9-10	~~7 11~~ 8-6	~~7 1~~ 7-7	~~6 4~~ 6-11	~~5 5~~ 6-4	~~4 8~~ 5-9	~~4 1~~ 5-4
	3-2x6	~~6 0~~ 6-6	~~5 0~~ 5-7	~~4 0~~ 5-0	~~4 0~~ 4-7	~~3 11~~ 4-2	~~3 5~~ 3-9	~~3 0~~ 3-5
	3-2x8	~~8 1~~ 8-8	~~7 0~~ 7-6	~~6 0~~ 6-8	~~5 0~~ 6-1	~~5 2~~ 5-6	~~4 6~~ 5-0	~~4 0~~ 4-7
	3-2x10	~~9 10~~ 10-7	~~8 6~~ 9-2	~~7 0~~ 8-2	~~7 0~~ 7-6	~~6 5~~ 6-11	~~5 9~~ 6-4	~~5 1~~ 5-10
	3-2x12	~~11 6~~ 12-4	~~9 11~~ 10-8	~~8 11~~ 9-7	~~8 1~~ 8-9	~~7 6~~ 8-1	~~7 0~~ 7-7	~~6 8~~ 7-1
Redwood [h], Western Cedars [h], Ponderosa Pine [h], Red Pine [h]	1-2x6	~~3 4~~ 3-6	~~2 6~~ 2-11	~~1 11~~ 2-6	~~1 7~~ 2-3	~~1 4~~ 2-0	~~1 2~~ 1-11	~~1 0~~ 1-9
	1-2x8	~~4 2~~ 4-6	~~3 3~~ 3-10	~~2 7~~ 3-3	~~2 1~~ 2-11	~~1 9~~ 2-8	~~1 7~~ 2-6	~~1 4~~ 2-4
	1-2x10	~~5 1~~ 5-6	~~4 2~~ 4-9	~~3 3~~ 4-2	~~2 8~~ 3-9	~~2 3~~ 3-5	~~2 0~~ 3-2	~~1 9~~ 3-0
	1-2x12	~~5 11~~ 6-4	~~5 1~~ 5-6	~~4 0~~ 4-11	~~3 3~~ 4-6	~~2 9~~ 4-2	~~2 5~~ 3-11	~~2 1~~ 3-8
	2-2x6	~~4 11~~ 5-3	~~4 0~~ 4-7	~~3 10~~ 4-1	~~3 2~~ 3-6	~~2 8~~ 3-2	~~2 4~~ 2-11	~~2 1~~ 2-8
	2-2x8	~~6 3~~ 6-8	~~5 5~~ 5-9	~~4 10~~ 5-2	~~4 2~~ 4-8	~~3 7~~ 4-2	~~3 1~~ 3-10	~~2 9~~ 3-6
	2-2x10	~~7 7~~ 8-2	~~6 7~~ 7-1	~~5 10~~ 6-4	~~5 4~~ 5-9	~~4 7~~ 5-4	~~3 11~~ 4-10	~~3 6~~ 4-6
	2-2x12	~~9 10~~ 9-5	~~7 7~~ 8-2	~~6 10~~ 7-4	~~6 0~~ 6-8	~~5 6~~ 6-2	~~4 10~~ 5-9	~~4 0~~ 5-5
	3-2x6	~~6 2~~ 6-4	~~5 4~~ 5-8	~~4 9~~ 5-1	~~4 4~~ 4-8	~~4 0~~ 4-3	~~3 8~~ 3-10	~~3 4~~ 3-6
	3-2x8	~~7 9~~ 8-4	~~6 9~~ 7-3	~~6 0~~ 6-5	~~5 6~~ 5-11	~~5 1~~ 5-5	~~4 8~~ 5-1	~~4 1~~ 4-8
	3-2x10	~~9 6~~ 10-2	~~8 8~~ 9-10	~~7 4~~ 7-11	~~6 9~~ 7-2	~~6 0~~ 6-8	~~5 10~~ 6-3	~~5 3~~ 5-11
	3-2x12	~~11 0~~ 11-10	~~9 6~~ 10-3	~~8 6~~ 9-2	~~7 9~~ 8-4	~~7 0~~ 7-9	~~6 9~~ 7-3	~~6 4~~ 6-10

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

a. Interpolation allowed. Extrapolation is not allowed.

b. Beams supporting a single span of joists with or without cantilever.

c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.

d. No. 2 grade, wet service factor included.

e. Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.

f. Beam cantilevers are limited to the adjacent beam's span divided by 4.

g. Includes incising factor

h. Incising factor not included.

i. Deck joist span as shown in Figure R507.5

TABLE R507.6

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						

MAXIMUM DECK JOIST SPANS

TABLE R507.6
MAXIMUM DECK JOIST SPANS

LOAD [a] (psf)	JOIST SPECIES [b]	JOIST SIZE	ALLOWABLE JOIST SPAN [b,c] (feet-inches) Joist Spacing (inches)			MAXIMUM CANTILEVER [d,g] (feet-inches) ~~Adecent~~ Joist Back Span [g] (feet)							
			12	16	24	4	6	8	10	12	14	16	18
40 Live Load	Southern Pine	2x6	9-11	9-0	7-7	1-0	1-6	1-5	NP	NP	NP	NP	NP
		2x8	13-1	11-10	9-8	1-0	1-6	2-0	2-6	2-3	NP	NP	NP
		2x10	16-2	14-0	11-5	1-0	1-6	2-0	2-6	3-0	3-4	3-4	NP
		2x12	18-0	16-6	13-6	1-0	1-6	2-0	2-6	3-0	3-6	4-0	4-1
	Douglas fir-larch [e], Hem-fir [e], Spruce-pine-fir [e]	2x6	9-6	8-4	6-10	1-0	1-6	1-4	NP	NP	NP	NP	NP
		2x8	12-6	11-1	9-1	1-0	1-6	2-0	2-3	2-0	NP	NP	NP
		2x10	15-8	13-7	11-1	1-0	1-6	2-0	2-6	3-0	3-3	NP	NP
		2x12	18-0	15-9	12-10	1-0	1-6	2-0	2-6	3-0	3-6	3-11	3-11
	Redwood [f], Western Cedars [f]	2x6	8-10	8-0	6-10	1-0	1-4	1-1	NP	NP	NP	NP	NP
		2x8	11-8	10-7	8-8	1-0	1-6	2-0	1-11	NP	NP	NP	NP
		2x10	14-11	13-0	10-7	1-0	1-6	2-0	2-6	3-0	2-9	NP	NP
	Ponderosa Pine [f], Red Pine [f]	2x12	17-5	15-1	12-4	1-0	1-6	2-0	2-6	3-0	3-6	3-8	NP
50 Ground Snow Load	Southern Pine	2x6	9-2	8-4	7-4	1-0	1-6	1-5	NP	NP	NP	NP	NP
		2x8	12-1	11-0	~~9-7~~ 9-5	1-0	1-6	2-0	2-5	2-3	NP	NP	NP
		2x10	15-5	~~14-1~~ 13-9	~~12-8~~ 11-3	1-0	1-6	2-0	2-6	3-0	3-1	NP	NP
		2x12	18-0	~~17-1~~ 16-2	~~14-6~~ 13-2	1-0	1-6	2-0	2-6	3-0	3-6	3-10	3-10
	Douglas fir-larch [e], Hem-fir [e], Spruce-pine-fir [e]	2x6	8-10	8-0	~~7-0~~ 6-8	1-0	1-6	1-4	NP	NP	NP	NP	NP
		2x8	11-7	10-7	~~9-3~~ 8-11	1-0	1-6	2-0	2-3	NP	NP	NP	NP
		2x10	14-10	~~13-6~~ 13-3	~~11-9~~ 10-10	1-0	1-6	2-0	2-6	3-0	3-0	NP	NP
		2x12	~~18-0~~ 17-9	~~16-5~~ 15-5	13-912-7	1-0	1-6	2-0	2-6	3-0	3-6	3-8	NP
	Redwood [f], Western Cedars [f]	2x6	8-3	7-6	~~6-8~~ 6-6	1-0	1-4	1-1	NP	NP	NP	NP	NP
		2x8	10-10	9-10	~~8-7~~ 8-6	1-0	1-6	2-0	1-11	NP	NP	NP	NP
		2x10	13-10	12-7	~~11-0~~ 10-5	1-0	1-6	2-0	2-6	2-9	NP	NP	NP
	Ponderosa Pine [f], Red Pine [f]	2x12	16-10	~~15-9~~ 14-9	~~13-2~~ 12-1	1-0	1-6	2-0	2-6	3-0	3-5	3-5	NP
60 Ground Snow Load	Southern Pine	2x6	8-8	7-10	6-10	1-0	1-6	1-5	NP	NP	NP	NP	NP
		2x8	11-5	10-4	~~9-1~~ 8-9	1-0	1-6	2-0	2-4	NP	NP	NP	NP
		2x10	14-7	~~13-3~~ 12-9	~~11-7~~ 10-5	1-0	1-6	2-0	2-6	2-11	2-11	NP	NP
		2x12	~~17-8~~ 17-3	~~16-1~~ 15-0	~~14-0~~ 12-3	1-0	1-6	2-0	2-6	3-0	3-6	3-7	NP
	Douglas fir-larch [e], Hem-fir [e], Spruce-pine-fir [e]	2x6	8-4	7-6	~~6-7~~ 6-2	1-0	1-6	1-4	NP	NP	NP	NP	NP
		2x8	10-11	9-11	~~8-8~~ 8-3	1-0	1-6	2-0	2-2	NP	NP	NP	NP
		2x10	13-11	~~12-8~~ 12-4	~~11-1~~ 10-0	1-0	1-6	2-0	2-6	2-10	NP	NP	NP
		2x12	~~17-8~~ 16-6	~~15-5~~ 14-3	~~13-6~~ 11-8	1-0	1-6	2-0	2-6	3-0	3-5	3-5	NP
	Redwood [f], Western Cedars [f]	2x6	7-9	7-0	6-2	1-0	1-4	NP	NP	NP	NP	NP	NP
		2x8	10-2	9-3	~~8-1~~ 7-11	1-0	1-6	2-0	1-11	NP	NP	NP	NP
		2x10	13-0	~~11-10~~ 11-9	~~10-4~~ 9-7	1-0	1-6	2-0	2-6	2-7	NP	NP	NP
	Ponderosa Pine [f], Red Pine [f]	2x12	~~15-10~~ 15-9	~~14-4~~ 13-8	~~12-7~~ 11-2	1-0	1-6	2-0	2-6	3-0	3-2	NP	NP
70 Ground Snow Load	Southern Pine	2x6	8-3	7-6	~~6-6~~ 6-5	1-0	1-6	1-5	NP	NP	NP	NP	NP
		2x8	10-10	9-10	~~8-7~~ 8-2	1-0	1-6	2-0	2-2	NP	NP	NP	NP
		2x10	~~13-10~~ 13-9	~~12-7~~ 11-11	~~11-0~~ 9-9	1-0	1-6	2-0	2-6	2-9	NP	NP	NP
		2x12	~~16-10~~ 16-2	~~15-0~~ 14-0	~~13-4~~ 11-5	1-0	1-6	2-0	2-6	3-0	3-5	3-5	NP
	Douglas fir-larch [e], Hem-fir [e], Spruce-pine-fir [e]	2x6	7-11	~~7-2~~ 7-1	~~6-3~~ 5-9	1-0	1-6	NP	NP	NP	NP	NP	NP
		2x8	10-5	9-5	~~8-3~~ 7-8	1-0	1-6	2-0	2-1	NP	NP	NP	NP
		2x10	13-3	~~12-0~~ 11-6	~~10-6~~ 9-5	1-0	1-6	2-0	2-6	2-8	NP	NP	NP
		2012	~~15-1~~ 15-5	~~14-0~~ 13-4	~~12-10~~ 10-11	1-0	1-6	2-0	2-6	3-0	3-3	~~3-3~~ NP	NP
	Redwood [f], Western Cedars [f]	2x6	7-4	6-8	5-10	1-0	1-4	NP	NP	NP	NP	NP	NP
		2x8	9-8	8-10	~~7-8~~ 7-4	1-0	1-6	1-11	NP	NP	NP	NP	NP
		2x10	12-4	~~11-3~~ 11-0	~~9-10~~ 9-0	1-0	1-6	2-0	2-6	2-6	NP	NP	NP
	Ponderosa Pine [f], Red Pine [f]	2x12	~~15-0~~ 14-9	~~13-5~~ 12-9	~~11-11~~ 10-5	1-0	1-6	2-0	2-6	~~2-9~~ 3-0	3-0	NP	NP

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg. NP = Not Permitted

a. Dead load = 10 psf. Snow load not assumed to be concurrent with live load.

b. No. 2 grade, wet service factor included.

c. L/Δ = 360 at main span.

d. L/Δ = 180 at cantilever with 220-pound point load applied to end.

e. Includes incising factor.

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact							
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						

f. Incising factor not included.

g. Interpolation permitted. Extrapolation is not permitted.

TABLE R507.9.1.3(1)
DECK LEDGER CONNECTION TO BAND JOIST

LOAD [c] (psf)	JOIST SPAN [a] (feet)	On-CENTER SPACING OF FASTENERS [b] (inches)		
		1/2-inch diameter lag screw with 1/2-inch maximum sheathing [d,e]	1/2-inch diameter bolt with 1/2-inch maximum sheathing [e]	1/2-inch diameter bolt with 1-inch maximum sheathing [f]
40 Live Load	6	30	36	36
	8	23	36	36
	10	18	34	29
	12	15	29	24
	14	13	24	21
	16	11	21	18
	18	10	19	16
50 Ground Snow Load	6	29	36	36
	8	22	36	35
	10	17	33	28
	12	14	27	23
	14	12	23	20
	16	11	20	17
	18	9	18	15
60 Ground Snow Load	6	25	36	36
	8	18	35	30
	10	~~17~~ 15	~~30~~ 28	~~28~~ 24
	12	~~14~~ 12	~~27~~ 23	~~23~~ 20
	14	~~12~~ 10	~~23~~ 20	~~20~~ 17
	16	~~11~~ 9	~~20~~ 17	~~17~~ 15
	18	~~9~~ 8	~~18~~ 15	~~15~~ 13
70 Ground Snow Load	6	22	36	35
	8	16	31	26
	10	13	25	21
	12	11	20	17
	14	9	17	15
	16	8	15	13
	18	7	13	11

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. Interpolation permitted. Extrapolation is not permitted.

b. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.

c. Dead Load = 10 psf. Snow load shall not be assumed to act concurrently with live load.

d. The tip of the lag screw shall fully extend beyond the inside face of the band joist.

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	e. Sheathing shall be wood structural panel or solid sawn lumber. f. Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to $^1/_2$-inch thickness of stacked washers shall be permitted to substitute for up to $^1/_2$ inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.					
RB185-19	**R312.1.4 Exterior Plastic Composite guards.** Plastic composite exterior ~~Exterior~~ *guards* shall comply with the requirements of Section ~~R507.10~~ R317.4.			X	$1 /Sqft.	Clarification enhancing safety
RB186-19	**TABLE R507.2.3** **FASTENER AND CONNECTOR SPECIFICATIONS FOR DECKS[a, b]** The modification restores rivets and puts in the term 'glulam' to be consistent with the term used in ASTM F1667. Adding the Class D is appropriate for this product. (Vote: 11-0)		X			Restores rivets and puts in the term 'glulam' for consistency with the term used in ASTM F1667.
RB187-19	**R507.3 Footings.** Decks shall be supported on concrete footings or other approved structural systems designed to accommodate all loads in accordance with Section R301. Deck footings shall be sized to carry the imposed loads from the deck structure to the ground as shown in Figure R507.3. ~~The footing depth shall be in accordance with Section R403.1.4.~~ **Exceptions:** 1. Footings shall not be required for free ~~Free-~~decks consisting of joists directly supported on grade over their entire length. 2. Footings shall not be required for freestanding decks that meet all of the following criteria: 2.1. The joists bear directly on precast concrete pier blocks at grade without support by beams or posts, 2.2. The area of the deck does not exceed 200 square feet, 2.3. The walking surface is not more than 20 inches above grade at any point within 36 inches measured horizontally from the edge. **R507.3.2 Minimum depth.** ~~Deck footings shall extend below the frost line specified in Table R301.2(1) in accordance with Section R403.1.4.1.~~ Deck footings shall be placed not less than 12 inches below the undisturbed ground surface. ~~**Exceptions:**~~ 1. ~~Free-standing decks that meet all of the following criteria:~~ 1.1. ~~The joists bear directly on precast concrete pier blocks at grade without support by beams or posts.~~ 1.2. ~~The area of the deck does not exceed 200 square feet (18.9 m^2).~~		X			Reorganization to add clarity to the code requirements

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	1.3. ~~The walking surface is not more than 20 inches (616 mm) above grade at any point within 36 inches (914 mm) measured horizontally from the edge.~~ 2. ~~Free-standing decks need not be provided with footings that extend below the frost line.~~ **R507.3.3 Frost protection.** Where decks are attached to a frost protected structure, deck footings shall be protected from frost by one or more of the following methods: 1. By extending below the frost line specified in Table R301.2(1). 2. By erecting on solid rock. 3. Other approved methods of frost protection. **R403.1.4 Minimum depth.** Exterior footings shall be placed not less than 12 inches (305 mm) below the undisturbed ground surface. Where applicable, the depth of footings shall also conform to Sections R403.1.4.1 through R403.1.4.2. Deck footings shall be in accordance with Section R507.3. **R403.1.4.1 Frost protection.** Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods: 1. Extended below the frost line specified in Table R301.2.(1). 2. Constructed in accordance with Section R403.3. 3. Constructed in accordance with ASCE 32. 4. Erected on solid rock. Footings shall not bear on frozen soil unless the frozen condition is permanent. **Exceptions:** 1. Protection of free-standing *accessory structures* with an area of 600 square feet (56 m^2) or less, of light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required. 2. Protection of free-standing *accessory structures* with an area of 400 square feet (37 m^2) or less, of other than light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required. 3. ~~Decks not supported by a dwelling need not be provided with footings that extend below the frost line.~~					
RB188-19	**R507.5 Deck Beams.** Maximum allowable spans for wood deck beams, as shown in Figure R507.5, shall be in accordance with Table R507.5. Beam plies shall be fastened together with two rows of 10d (3-inch × 0.128-inch) nails minimum at 16 inches (406 mm) on center along each edge. Beams shall be permitted to cantilever at each end up to one-fourth of the allowable beam span. Deck beams of other materials shall be		X			Clarification

<table>
<tr><th colspan="7">Table 11. 2021 IRC STRUCTURAL Changes Cost Impact</th></tr>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IRC STRUCTURAL CHANGES SUMMARY</th><th colspan="3">IRC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>permitted where designed in accordance with accepted engineering practices.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>RB189-19</td><td>R507.5 Deck Beams. Maximum allowable spans for wood deck beams, as shown in Figure R507.5, shall be in accordance with Table R507.5. Beam plies shall be fastened with two rows of 10d (3-inch × 0.128-inch) nails minimum at 16 inches (406 mm) on center along each edge. Beams shall be permitted to cantilever at each end up to one-fourth of the ~~allowable~~ actual beam span. Deck beams of other materials shall be permitted where designed in accordance with accepted engineering practices.</td><td></td><td></td><td>X</td><td>Minimal depending on cantilever</td><td>Clarification</td></tr>
<tr><td>RB190-19</td><td>TABLE R507.5
DECK BEAM SPAN LENGTHS[a, b, c] ~~(feet - inches)~~
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.
a. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220-pound point load applied at the end.
b. Beams supporting deck joists from one side only.
c. No. 2 grade, wet service factor.
d. Beam depth shall be greater than or equal to depth of joists with a flush beam condition.
e. Includes incising factor.
f. Northern species. Incising factor not included.
g. Beam cantilevers are limited to the adjacent beam's span/4.
h. For calculation of effective deck joist span, the actual joist span length shall be multiplied by the joist span factor from the following table.
i.
<table><tr><th>C/J</th><th>Joist span factor</th></tr><tr><td>0 (no cantilever)</td><td>0.66</td></tr><tr><td>1/12 (0.87)</td><td>0.72</td></tr><tr><td>1/10 (0.10)</td><td>0.80</td></tr><tr><td>1/8 (0.125)</td><td>0.84</td></tr><tr><td>1/6 (0.167)</td><td>0.90</td></tr><tr><td>1/4 (0.250)</td><td>1.00</td></tr></table>J = actual joist span length (feet)
C= actual joist cantilever length (feet)</td><td>X</td><td></td><td></td><td>Minimal depending on cantilever</td><td>Clarification</td></tr>
</table>

<table>
<tr><th colspan="7">Table 11. 2021 IRC STRUCTURAL Changes Cost Impact</th></tr>
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<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td>RB191-19</td><td>R507.7 Decking. Maximum allowable spacing for joists supporting wood decking, excluding stairways, shall be in accordance with Table R507.7. Wood decking shall be attached to each supporting member with not less than two 8d threaded nails or two No. 8 wood screws. Maximum allowable spacing for joists supporting plastic composite decking shall be in accordance with Section R507.2. Other approved decking or fastener systems shall be installed in accordance with the manufacturer's installation requirements.
TABLE R507.7
MAXIMUM JOIST SPACING FOR WOOD DECKING
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.01745 rad.
a. Maximum angle of 45 degrees from perpendicular for wood deck boards.
b. Or other maximum span provided by an accredited lumber grading or inspection agency.
c. Individual wood deck boards supported by two joists shall be considered single span and three or more joists shall be considered multi-span.</td><td>X</td><td></td><td></td><td>Minimal</td><td>Clarification</td></tr>
<tr><td>RB192-19</td><td>R507.9.1.2 Band joist details. Band joists supporting a ledger shall be a minimum 2-inch-nominal (51 mm), solid-sawn, spruce-pine-fir or better lumber or ~~a~~ minimum 1-inch ~~by 9 1/2 inch~~ (25 ~~mm × 241 mm) dimensional, Douglas fir or better, laminated veneer lumber.~~ mm) nominal engineered wood rim boards in accordance with Section R502.1.7. Band joists shall bear fully on the primary structure capable of supporting all required loads.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>RB193-19</td><td>[Reserved under FBC]
TABLE R602.3(1)
FASTENING SCHEDULE
Adds language to footnote a in order to clarify that the table pertains to carbon steel fasteners and connections and clarifies that the code change, as approved by the CAH, deletes stainless steel nails and staples from the table. The added language is proposed because if is feared that users of the code will easily miss this change, and not necessarily understand that stainless steel (or other materials) may not perform the same as carbon steel. These other materials may require differences in deign to achieve equivalent performance.</td><td></td><td>X</td><td></td><td></td><td>Clarifies that table pertains to carbon steel fasteners and connections and that code change deletes stainless steel nails & staples</td></tr>
<tr><td>RB194-19</td><td>[Reserved under FBC]
TABLE R602.3(1)
FASTENING SCHEDULE
<table><tr><th>ITEM</th><th>DESCRIPTION OF BUILDING LEMENTS</th><th>NUMBER AND TYPE OF FASTENER[a, b, c]</th><th>SPACING AND LOCATION</th></tr><tr><td colspan="4">Wall</td></tr></table></td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	Sub Code:					
	<table><tr><td>12</td><td>Adjacent full-height stud to end of header</td><td>4-16d box (3 1/2' x 0.135"; or 3-16d common (3 1/2" x 0.162"); or 4-10d box (3" x 0.128"); or 4 - 3" x 0.131" nails</td><td>End nail</td></tr></table> **R602.7.5 Supports for headers.** Headers shall be supported on each end with one or more jack studs or with approved framing anchors in accordance with Table R602.7(1) or R602.7(2). The full-height stud adjacent to each end of the header shall be end nailed to each end of the header ~~with four 16d nails (3.5 inches × 0.135 inches).~~ in accordance with Table R602.3(1). The minimum number of full-height studs at each end of a header shall be in accordance with Table R602.7.5.					
RB195-19	**[Reserved under FBC]** **TABLE R602.3(1)** **FASTENING SCHEDULE** For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1 ksi = 6.895 MPa. g. Gypsum sheathing shall conform to ASTM C1396 and shall be installed in accordance with GA 253 or ASTM C1280. Fiberboard sheathing shall conform to ASTM C208. **ASTM** C1280-18: Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing		X			ASTM C1280 provided additional construction options.
RB196-19	**[Reserved under FBC]** **TABLE R602.3(1)** **FASTENING SCHEDULE** For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1 ksi = 6.895 MPa. f. For wood structural panel roof sheathing attached to gable end roof framing and to intermediate supports within 48 inches of roof edges and ridges, nails shall be spaced at 4 inches on center where the ultimate design wind speed is greater than 130 mph in Exposure B or greater than 110 mph in Exposure C.			X		Clarification
RB197-19	**[Reserved under FBC]** **TABLE R602.3(2)** **ALTERNATE ATTACHMENTS TO TABLE R602.3(1)** For SI: 1 inch = 25.4 mm. a. Nail is a general description and shall be permitted to be T-head, modified round head or round head. b. Staples shall have a minimum crown width of 7/16-inch ~~on diameter~~ except as noted. c. Nails or staples shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches or greater. Nails or staples shall be spaced at not more than 12 inches on center at intermediate supports for floors.		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	d. Fasteners shall be placed in a grid pattern throughout the body of the panel. e. For 5-ply panels, intermediate nails shall be spaced not more than 12 inches on center each way. f. Hardboard underlayment shall conform to CPA/ANSI A135.4 g. Specified alternate attachments for roof sheathing shall be permitted where the ultimate design wind speed is less than 130 mph. Fasteners attaching wood structural panel roof sheathing to gable end wall framing shall be installed using the spacing listed for panel edges. h. Fiber-cement underlayment shall conform to ASTM C1288 or ISO 8336, Category C.					
RB198-19	**[Reserved under FBC]** **TABLE R602.3(2)** **ALTERNATE ATTACHMENTS TO TABLE R602.3(1)** *(Portions of table and footnotes not shown remain unchanged)* g. Alternate fastening is only permitted for roof sheathing where ~~Where~~ the ultimate design wind speed is less than or equal to 110 mph, and ~~roof sheathing attachment using the specified alternate fasteners shall be permitted~~ where fasteners are installed 3 inches on center at all supports.			X	Minimal	Clarification
RB199-19	**[Reserved under FBC]** **R602.10.1.2 Location of braced wall lines and permitted offsets.** Each braced wall line shall be located such that no more than two-thirds of the required braced wall panel length is located to one side of the braced wall line. Braced wall panels shall be permitted to be offset up to four feet from the designated braced wall line. ~~Where braced wall panels along a braced wall line fall in a single line, the braced wall line shall be located at those braced wall panels. Where braced wall panels are offset out of plane, the braced wall line shall be located at or between the braced wall panels, and the braced wall line shall not be located outboard or inboard of all the braced wall panels in that braced wall line. Where 2/3 or more of the length of braced wall panels in a braced wall line fall in a single line, the braced wall line shall be located at those braced wall panels; or the braced wall line shall be located at the centroid of the braced wall panels, as seen in Figure R602.10.1.1.Exterior braced wall panels parallel to a *braced wall line* shall be offset not more than 4 feet (1219 mm) from the designated *braced wall line* location as shown in Figure R602.10.1.1.~~ Exterior walls parallel to a *braced wall line* shall be offset not more than 4 feet (1219 mm) from the designated *braced wall line* location as shown in Figure R602.10.1.1.		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Interior walls used as bracing shall be offset not more than 4 feet (1219 mm) from a *braced wall line* through the interior of the building as shown in Figure R602.10.1.1.					
RB200-19	**[Reserved under FBC]** **R602.10.2.2 Locations of braced wall panels.** A *braced wall panel* shall begin within 10 feet (3810 mm) from each end of a *braced wall line* as determined in Section R602.10.1.1. The distance between adjacent edges of *braced wall panel*s along a *braced wall line* shall be not greater than 20 feet (6096 mm) as shown in Figure R602.10.2.2. **Exceptions:** 1. Braced wall panels in Seismic Design Categories D0, D_1, and D_2shall comply with Section R602.10.2.2.1. 2. Braced wall panels with continuous sheathing in Seismic Design Categories A, B, or C shall comply with Section R602.10.7. **R602.10.2.2.1 Location of braced wall panels in Seismic Design Categories ~~D~~D0, D_1 and D_2.** Braced wall panels shall be located at each end of a braced wall line. **~~Exception~~ Exceptions:** 1. Braced wall panels constructed of Method WSP or BV-WSP and continuous sheathing methods as specified in Section R602.10.4 shall be permitted to begin not more than 10 feet (3048 mm) from each end of a braced wall line provided that each end complies with one of the following: ~~1.~~ 1.1. A minimum 24-inch-wide (610 mm) panel for Methods WSP, CS-WSP, CS-G and CS-PF is applied to each side of the building corner as shown in End Condition 4 of Figure R602.10.7. ~~2.~~ 1.2. The end of each braced wall panel closest to the end of the braced wall line shall have an 1,800 lb (8 kN) hold-down device fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below as shown in End Condition 5 of Figure R602.10.7. 2. Braced wall panels constructed of Method PFH or ABW, or of Method BV-WSP where a hold-down is provided in accordance with Table R602.10.6.5, shall be permitted to begin not more than 10 feet from each end of a braced wall line.		X			Clarification
RB201-19	**[Reserved under FBC]** **TABLE R602.10.3(2)** **WIND ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING** **TABLE R602.10.3(4)** **SEISMIC ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING**			X	Minimal	Modifications remove option for SFB and HPS products because the products are too soft for

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	Committee Reason: The modifications removed the proposed options for SFB and HPS products because the products are too soft for bracing without uniform nailing and blocking. The proposal appropriately adds for PBS as an additional design option.					Bracing w/o uniform nailing and blocking
RB202-19	**[Reserved under FBC]** **TABLE R602.10.3(3)** **BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY** For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa. NP = Not Permitted. a. Linear interpolation shall be permitted. b. ~~Wall bracing lengths are based on a soil site class "D."~~ Interpolation of bracing length between the S_{ds} values associated with the seismic design categories shall be permitted when a site-specific S_{ds} value is determined in accordance with Section 1613.2 of the International Building Code. c. Where the braced wall line length is greater than 50 feet, braced wall lines shall be permitted to be divided into shorter segments having lengths of 50 feet or less, and the amount of bracing within each segment shall be in accordance with this table. d. Method LIB shall have gypsum board fastened to not less than one side with nails or screws in accordance with Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum board. Spacing of fasteners at panel edges shall not exceed 8 inches. e. Methods PFG and CS-SFB do not apply in Seismic Design Categories D_0, D_1 and D_2. f. Where more than one bracing method is used, mixing methods shall be in accordance with Section R602.10.4.1.		X			Clarification
RB203-19	**[Reserved under FBC]** **TABLE R602.10.3(3)** **BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY** For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa. NP = Not Permitted. a. Linear interpolation shall be permitted. b. Wall bracing lengths are based on a soil site class "D." Interpolation of bracing length between the Sds values associated with the seismic design categories shall be permitted when a site-specific Sds value is determined in accordance with Section 1613.2 of the International Building Code. c. Where the braced wall line length is greater than 50 feet, braced wall lines shall be permitted to be divided into shorter segments having lengths of 50 feet or less, and the amount of bracing within each segment shall be in accordance with this table. d. Method LIB shall have gypsum board fastened to not less than one side with nails or screws in accordance with Table R602.3(1) for		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact

CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT: Decrease	IRC COST IMPACT: None	IRC COST IMPACT: Increase	ESTIMATED AMOUNT*	BENEFIT OF CHANGE

Sub Code:

exterior sheathing or Table R702.3.5 for interior gypsum board. Spacing of fasteners at panel edges shall not exceed 8 inches.

e. Methods PFG and CS-SFB do not apply in Seismic Design Categories D0, D1 and D2.

f. Methods PFH, PFG and ABW are only permitted on a single story or a first of two stories.

g. Where more than one bracing method is used, mixing methods shall be in accordance with Section R602.10.4.1.

CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	Decrease	None	Increase	ESTIMATED AMOUNT*	BENEFIT OF CHANGE
RB204-19	[Reserved under FBC] (see below)		X			Clarification

[Reserved under FBC]

TABLE R602.10.3(3)
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY

SOIL CLASS D[b] WALL HEIGHT = 10 FEET 10 PSF FLOOR DEAD LOAD 15 PSF ROOF/CEILING DEAD LOAD BRACED WALL LINE SPACING 25 FEET			MINIMUM TOTAL LENGTH (FEET) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a, f]				
Seismic Design Category	Story Location	Braced Wall Line Length(feet)[c]	Method LIB[d]	Method GB	Methods DWB, SFB, PBS,PCP, HPS,CS-SFB[e]	Method WSP	Methods CS-WSP,CS-G, CS-PF
D_2[g]		10	NP	4.0	4.0	2.5	2.1
		20	NP	8.0	8.0	5.0	4.3
		30	NP	12.0	12.0	7.5	6.4
		40	NP	16.0	16.0	10.0	8.5
		50	NP	20.0	20.0	12.5	10.6
		10	NP	7.5	7.5	5.5	4.7
		20	NP	15.0	15.0	11.0	9.4
		30	NP	22.5	22.5	16.5	14.0
		40	NP	30.0	30.0	22.0	18.7
		50	NP	37.5	37.5	27.5	23.4
	Three-story dwelling	10	NP	NP	NP	NP	NP
		20	NP	NP	NP	NP	NP
		30	NP	NP	NP	NP	NP
		40	NP	NP	NP	NP	NP
		50	NP	NP	NP	NP	NP
	Cripple wall below one- or two-story dwelling	10	NP	NP	NP	7.5	6.4
		20	NP	NP	NP	15.0	12.8
		30	NP	NP	NP	22.5	19.1
		40	NP	NP	NP	30.0	25.5
		50	NP	NP	NP	37.5	31.9

g. One- and two-family dwellings in Seismic Design Category D exceeding two stories shall be designed in accordance with accepted engineering practice.

TABLE R602.10.3(4)
SEISMIC ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING

For SI: 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. Linear interpolation shall be permitted.

b. The total length of bracing required for a given wall line is the product of all applicable adjustment factors.

c. The length-to-width ratio for the floor/roof diaphragm shall not exceed 3:1.

d. Applies to stone or masonry veneer exceeding the first story height.

e. The adjustment factor for stone or masonry veneer shall be applied to all exterior braced wall lines and all braced wall lines on the

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact

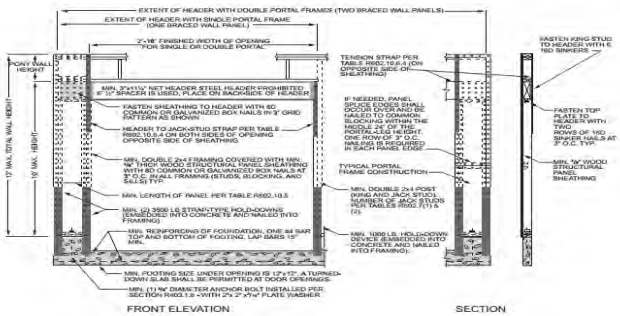
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
	Sub Code:					
	interior of the building, backing or perpendicular to and laterally supporting veneered walls. f. See Section R602.10.6.5 for requirements where stone or masonry veneer does not exceed the first-story height. g. <u>One- and two-family dwellings in Seismic Design Category D_2 exceeding two stories shall be designed in accordance with accepted engineering practice.</u> TABLE R602.10.6.5 METHOD BV-WSP WALL BRACING REQUIREMENTS BRACED WALL LINE LENGTH (FEET) / Minimum Total Length (feet) of Braced Wall Panels Required Along each Braced Wall Line 10 / 20 / 30 / 40 / 50 SEISMIC DESIGNCATEGORY / STORY / SINGLE-STORYHOLD-DOWNFORCE(pounds)[a][c] / CUMULATIVE HOLD-DOWNFORCE (pounds)[a][c] D[d] Three-story dwelling: 5.5 / 11.0 / 16.5 / 22.0 / 27.5 / 2300 5.5 / 11.0 / 16.5 / 22.0 / 27.5 / 2900 / 6200 NP / NP / NP / NP / NP / NA / NA For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.479 kPa, 1 pound-force = 4.448 N. NP = Not Permitted. NA = Not Applicable. a. One- and two-family dwellings in Seismic Design Category D_2 exceeding two stories shall be designed in accordance with accepted engineering practice. a b. Hold-down force is minimum allowable stress design load for connector providing uplift tie from wall framing at end of braced wall panel at the noted story to wall framing at end of braced wall panel at the story below, or to foundation or foundation wall. Use single-story hold-down force where edges of braced wall panels do not align; a continuous load path to the foundation shall be maintained. b c. Where hold-down connectors from stories above align with stories below, use cumulative hold-down force to size middle- and bottom-story hold-down connectors.					
RB205-19	**[Reserved under FBC]** **TABLE R602.10.4** **BRACING METHODS** **Reason:** ASTM F1667-18 requires that when gage is used as a diameter for nails, a decimal equivalent must also be shown. This requirement was put in place because of the multiple and conflicting wire gage tables that are used in the manufacturing of nails.		X			Clarification
RB206-19	**[Reserved under FBC]** **R602.10.6.2 Method PFH: Portal frame with hold-downs.** Method PFH *braced wall panel*s shall be constructed in accordance with Figure R602.10.6.2.  FRONT ELEVATION SECTION		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm. **FIGURE R602.10.6.2** **METHOD PFH—PORTAL FRAME WITH HOLD-DOWNS**					
RB207-19	**[Reserved under FBC]** **R602.10.6.4 Method CS-PF: Continuously sheathed portal frame.** Continuously sheathed portal frame *braced wall panel*s shall be constructed in accordance with Figure R602.10.6.4 and Table R602.10.6.4. ~~The number of continuously sheathed portal frame panels in a single *braced wall line* shall not exceed four.~~ **R602.12.6.2 Method CS-PF.** Braced wall panels constructed as Method CS-PF in accordance with Section R602.10.6.4 shall be permitted where all framed portions of all exterior walls are sheathed with wood structural panels. Each CS-PF panel shall equal 0.75 bracing units. ~~Not more than four CS-PF panels shall be permitted on all segments of walls parallel to each side of the circumscribed rectangle.~~ Segments of wall that include a Method CS-PF panel shall meet the requirements of Section R602.10.4.2.		X			Clarification
RB208-19	**[Reserved under FBC]** **R602.10.6.5 Wall bracing for dwellings with stone and masonry veneer in Seismic Design Categories D_0, D_1 and D_2.** Townhouses in Seismic Design Categories D_0, $D_1$and $D_2$with stone or masonry veneer exceeding the first-story height shall be designed in accordance with accepted engineering practice. One- and two-family dwellings in Seismic Design Category D_2exceeding two stories and having stone or masonry veneer shall be designed in accordance with accepted engineering practice. Where stone and masonry veneer are installed in accordance with Section R703.8, wall bracing on exterior *braced wall lines* and *braced wall lines* on the interior of the building, backing or perpendicular to and laterally supporting veneered walls shall comply with this section. Where dwellings in Seismic Design Categories D_0, D_1 and D_2 have stone or masonry veneer installed in accordance with Section R703.8, and the veneer does not exceed the first-story height, wall bracing shall be in accordance with Section R602.10.3. Where detached one- or two-family dwellings in Seismic Design Categories D_0, D_1 and D_2 have stone or masonry veneer installed in accordance with Section R703.8, and the veneer exceeds the first-*story height*, wall bracing at exterior *braced wall lines* and *braced wall lines* on the interior of the building shall be constructed using Method BV-WSP in accordance with this section and Figure R602.10.6.5. Cripple walls shall not be permitted, and required interior *braced wall lines* shall be supported on continuous foundations. Where detached one- or two-family *dwellings* in Seismic Design Categories D_0, D_1 and D_2 have exterior veneer installed in accordance with Section R703.8 and are braced in accordance with Method WSP or		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	CS-WSP, veneer shall be permitted in the second story in accordance with Item 1 or 2, provided that the *dwelling* does not extend more than two stories above grade plane, the veneer does not exceed 5 inches (127 mm) in thickness, the height of veneer on gable-end walls does not extend more than 8 feet (2438 mm) above the bearing wall top plate elevation, and the total length of *braced wall panel* specified by Table R602.10.3(3) is multiplied by 1.2 for each first- and second-story *braced wall line.* 1. The total area of the veneer on the second-story exterior walls shall be permitted to extend up to 25 percent of the occupied second floor area. 2. The veneer on the second-story exterior walls shall be permitted to cover one side of the *dwelling*, including walls on bay windows and similar appurtenances within the one dwelling side. ~~Townhouses in Seismic Design Categories D_0, D_1 and D_2 with stone or masonry veneer exceeding the first story height shall be designed in accordance with accepted engineering practice.~~					
RB209-19	**[Reserved under FBC]** **Committee Modification:** **R602.10.6.5.1 Veneer on First Story Only.** Where dwellings in Seismic Design Categories D0, D_1 and D_2 have stone or masonry veneer installed in accordance with Section R703.8, and the veneer does not exceed the first-story height, wall bracing shall be in accordance with Section R602.10, exclusive of ~~this section~~ Section R602.10.6.5.		X			Clarification
RB210-19	**[Reserved under FBC]** **TABLE R602.10.6.5** **METHOD BV-WSP WALL BRACING REQUIREMENTS[c]** For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.479 kPa, 1 pound-force = 4.448 N. NP = Not Permitted. NA = Not Applicable. a. Hold-down force is minimum allowable stress design load for connector providing uplift tie from wall framing at end of braced wall panel at the noted story to wall framing at end of braced wall panel at the story below, or to foundation or foundation wall. Use single-story hold-down force where edges of braced wall panels do not align; a continuous load path to the foundation shall be maintained. b. Where hold-down connectors from stories above align with stories below, use cumulative hold-down force to size middle- and bottom-story hold-down connectors. c. Interpolation between braced wall lengths is permitted.		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RB211-19	**[Reserved under FBC]** **R602.10.10.1 Cripple wall bracing for Seismic Design Categories D_0 and D_1 and townhouses in Seismic Design Category C.** In addition to the requirements in Section R602.10.10,cripple wall bracing shall be limited to methods WSP and CS-WSP, and the distance between adjacent edges of *braced wall panel*s for cripple walls along a *braced wall line* shall be 14 feet (4267 mm) maximum. Where *braced wall lines* at interior walls are not supported on a continuous foundation below, the adjacent parallel cripple walls, where provided, shall be braced with Method WSP or Method CS-WSP in accordance with Section R602.10.4. The length of bracing required in accordance with Table R602.10.3(3) for the cripple walls shall be multiplied by 1.5. Where the cripple walls do not have sufficient length to provide the required bracing, the spacing of panel edge fasteners shall be reduced to 4 inches (102 mm) on center and the required bracing length adjusted by 0.7. If the required length can still not be provided, the cripple wall shall be designed in accordance with accepted engineering practice.			X	Minimal	Clarification
RB213-19	**R608.1 General.** Exterior concrete walls shall be designed and constructed in accordance with the provisions of this section or in accordance with the provisions of PCA 100, ACI 318,or ACI 332. Where PCA 100, ACI 318, ACI 332 or the provisions of this section are used to design concrete walls, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design, unless otherwise required by the state law of the jurisdiction having authority. **R608.5.1 Concrete and materials for concrete.** Materials used in concrete, and the concrete itself, shall conform to requirements of this section, PCA 100, ~~or~~ ACI 318, or ACI 332.		X			Clarification
RB214-19	**R609.1 General.** This section prescribes performance and construction requirements for exterior windows and doors installed in walls. Windows and doors shall be installed ~~anchored~~ in accordance with the fenestration manufacturer's written installation instructions. ~~Section R609.7.~~ Window and door openings shall be flashed in accordance with Section R703.4. Written ~~Installation~~ installation instructions shall be provided by the fenestration manufacturer for each window or door.	X			Minimal	Clarification
RB215-19	**R609.4 Garage doors.** Garage doors shall be tested in accordance with either ASTM E330 or ANSI/DASMA 108, and shall meet the ~~acceptance~~ pass/fail criteria of ANSI/DASMA 108. **R609.4.1 Garage door labeling.** Garage doors shall ~~have~~ be labeled with a permanent label provided by the garage door manufacturer. The label shall identify ~~identifying~~ the garage door manufacturer, the garage door model/series number, the positive and negative design wind pressure rating, the installation instruction drawing reference number, and the applicable test standard.			X	Minimal	Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact

<table>
<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IRC STRUCTURAL CHANGES SUMMARY</th><th colspan="3">IRC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td>RB216-19</td><td>TABLE R702.3.5
MINIMUM THICKNESS AND APPLICATION OF GYPSUM BOARD AND GYPSUM PANEL PRODUCTS
(portions of the table and footnotes not shown remain unchanged)
c. Where cold-formed steel framing is used with a clinching design to receive nails by two edges of metal, the nails shall be not less than $^{5}/_{8}$ inch longer than the gypsum board or gypsum panel product thickness and shall have ringed shanks. Where the cold-formed steel framing has a nailing groove formed to receive the nails, the nails shall have barbed shanks or be ~~5d, 13$^{1}/_{2}$ gage,~~ 0.086 inch diameter $1^{5}/_{8}$ inches long, $^{15}/_{64}$-inch head for $^{1}/_{2}$-inch gypsum board or gypsum panel product; and ~~6d, 13 gage,~~ 0.099 inch diameter $1^{7}/_{8}$ inches long, $^{15}/_{64}$-inch head for $^{5}/_{8}$-inch gypsum board or gypsum panel product.</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
<tr><td>RB223-19</td><td>R702.7 Vapor retarders. Vapor retarder materials shall be classified in accordance with Table R702.7(1). A vapor retarder shall be provided on the interior side of frame walls of the class indicated in Table R702.7(2), including compliance with Table R702.7(3) or Table R702.7(4) where applicable. An approved design using accepted engineering practice for hygrothermal analysis shall be permitted as an alternative. The climate zone shall be determined in accordance with Section N1101.7 (R301.1).
Exceptions:
1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation, or freezing of moisture will not damage the materials.
4. A vapor retarder shall not be required in Climate Zones 1, 2, and 3.
R702.7(2)
VAPOR RETARDER OPTIONS
<table>
<tr><td rowspan="2">CLIMATE ZONE</td><td colspan="3">VAPOR RETARDER CLASS</td></tr>
<tr><td>CLASS I[a]</td><td>CLASS II[a]</td><td>CLASS III</td></tr>
<tr><td>1,2</td><td>Not Permitted</td><td>Not Permitted</td><td>Permitted</td></tr>
<tr><td>3, 4 (except Marine 4)</td><td>Not Permitted</td><td>Permitted[c]</td><td>Permitted</td></tr>
<tr><td>~~4 (except Marine 4)~~</td><td>~~Not Permitted~~</td><td>~~Permitted[c]~~</td><td rowspan="2">See Table R702.7(3)</td></tr>
<tr><td>Marine 4, 5, 6, 7, 8</td><td>Permitted[b]</td><td>Permitted[c]</td></tr>
</table>
(No further changes to the footnotes)

TABLE R702.7(3)
CLASS III VAPOR RETARDERS
(No further changes to the table or portion of the footnotes not shown)</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
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<table>
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<tr><th rowspan="2">CODE CHANGE #</th><th rowspan="2">2021 IRC STRUCTURAL CHANGES SUMMARY</th><th colspan="3">IRC COST IMPACT</th><th rowspan="2">ESTIMATED AMOUNT*</th><th rowspan="2">BENEFIT OF CHANGE</th></tr>
<tr><th>Decrease</th><th>None</th><th>Increase</th></tr>
<tr><td colspan="7">Sub Code:</td></tr>
<tr><td></td><td>
<table>
<tr><th>CLIMATEZONE</th><th>CLASS III VAPOR RETARDERS PERMITTED FOR:[a, b]</th></tr>
<tr><td rowspan="5">Marine 4</td><td>Vented cladding over wood structural panels.</td></tr>
<tr><td>Vented cladding over fiberboard.</td></tr>
<tr><td>Vented cladding over gypsum.</td></tr>
<tr><td>Continuous insulation with R-value ≥ 2.5 over 2 × 4 wall.</td></tr>
<tr><td>Continuous insulation with R-value ≥ 3.75 over 2 × 6 wall.</td></tr>
</table>
a. Vented cladding shall include vinyl, polypropylene, or horizontal aluminum siding, or brick veneer with a clear airspace as specified in Table R703.8.4(1), ~~and~~ or other approved vented claddings.
</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>RB230-19</td><td>R702.7.3 Minimum clear airspaces and vented openings for vented cladding. For the purposes of this section, vented cladding shall include the following minimum clear airspaces. Other openings with the equivalent vent area shall be permitted.
1. Vinyl polypropylene or horizontal aluminum siding applied over a weather-resistive barrier as specified in Table R703.3(1).
2. Brick veneer, anchored stone or masonry veneer with a clear airspace as specified in Table R703.8.4(1).
3. Other approved vented claddings.
~~R703.2~~ ~~Water-resistive barrier.~~ ~~One layer of No. 15 asphalt felt, free from holes and breaks, complying with ASTM D226 for Type 1 felt or other approved water-resistive barrier shall be applied over studs or sheathing of all exterior walls. No.15 asphalt felt shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints occur, felt shall be lapped not less than 6 inches (152 mm). Other *approved* materials shall be installed in accordance with the *water-resistive barrier* manufacturer's installation instructions. The No. 15 asphalt felt or other approved *water-resistive barrier* material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior wall envelope as described in Section R703.1.~~
R703.2 Water-resistive barrier. One layer of No. 15 asphalt felt, free from holes and breaks, complying with ASTM D226 for Type 1 felt or other approved Not fewer than one layer of water-resistive barrier shall be applied over studs or sheathing of all exterior walls. No.15 asphalt felt shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints</td><td></td><td>X</td><td></td><td></td><td>Clarification</td></tr>
</table>

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RB232-19	occur, felt shall be lapped not less than 6 inches (152 mm). Other *approved* materials shall be installed in accordance with the *water-resistive barrier* manufacturer's installation instructions. The No. 15 asphalt felt or other approved *water-resistive barrier* material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior wall envelope as described in Section R703.1.with flashing as indicated in Section R703.4, in such a manner as to provide a continuous *water-resistive barrier* behind the *exterior wall* veneer. Water-resistive barrier materials shall comply with one of the following: 1. No. 15 felt complying with ASTM D226, Type 1 2. ASTM E2556, Type 1 or 2 3. ASTM E331 in accordance with Section R703.1.1, or 4. Other approved materials in accordance with the manufacturer's installation instructions. **ASTM** E2556/E2556M-10: Standard Specification for Vapor Permeable Flexible Sheet Water-resistive Barriers Intended for Mechanical Attachment		X			Clarification
RB233-19	**R703.2 Water-resistive barrier.** Not fewer than one layer of water-resistive barrier shall be applied over studs or sheathing of all exterior walls with flashing as described in Section R703.4, in such a manner as to provide a continuous *water-resistive barrier* behind the *exterior wall* veneer. The *water-resistive barrier* material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior wall envelope as described in Section R703.1. Water-resistive barrier materials shall comply with one of the following: 1. No. 15 felt complying with ASTM D226, Type 1 2. ASTM E2556, Type I or II 3. ASTM E331 in accordance with Section R703.1.1 4. Other approved materials installed in accordance with the manufacturer's installation instructions. ~~5.~~ No.15 asphalt felt and water-resistive barriers complying with ASTM E2556 shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm), and where joints occur, shall be lapped not less than 6 inches (152 mm).		X			Clarification
RB234-19	**R704.2 Soffit installation where the design wind pressure is 30 psf or less.** Where the design wind pressure is 30 psf or less, soffit installation shall comply with Section R704.2.1, Section R704.2.2, Section R704.2.3, or Section R704.2.4. Soffit materials not addressed in Sections R704.2.1 through R704.2.4 shall be in accordance with the manufacturer's installation instructions.		X			Clarification

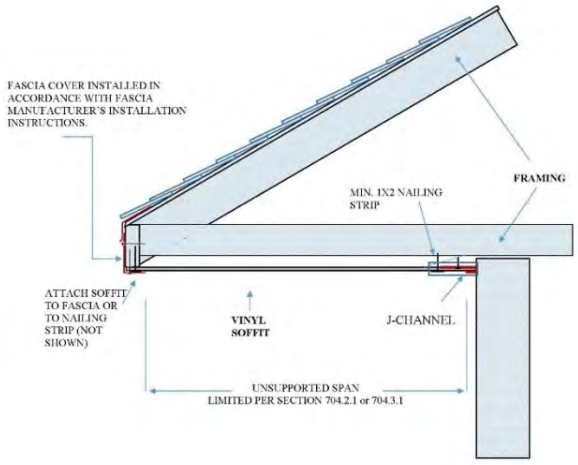
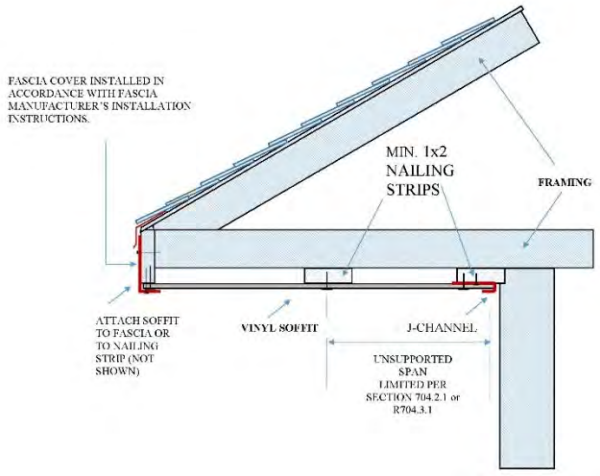
Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	R704.2.1 Vinyl soffit panels. Vinyl soffit panels shall be installed using fasteners specified by the manufacturer and shall be fastened at both ends to a supporting component such as a nailing strip, fascia or subfascia component in accordance with Figure R704.2.1. Where the unsupported span of soffit panels is greater than 16 inches, intermediate nailing strips shall be provided in accordance with Figure R704.2.~~1~~2. Vinyl soffit panels shall be installed in accordance with the manufacturer's installation instructions. Fascia covers shall be installed in accordance with the manufacturer's installation instructions. **Delete Proposed Figure R704.2.1 and Replace with the two following figures, R704.2.1 and R704.2.2:**  **FIGURE R704.2.1** **TYPICAL SINGLE SPAN VINYL SOFFIT PANEL SUPPORT**  **FIGURE R704.2.2**					

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	TYPICAL DOUBLE SPAN VINYL SOFFIT PANEL SUPPORT **R704.3 Soffit installation where the design wind pressure exceeds 30 psf.** Where the design wind pressure is greater than 30 psf, soffit installation shall comply with Section R704.3.1, Section R704.3.2, Section R704.3.3, or Section R704.3.4. Soffit materials not addressed in Sections R704.3.1 through R704.3.4 shall be in accordance with the manufacturer's installation instructions. **R704.3.1 Vinyl soffit panels.** Vinyl soffit panels and their attachments shall be capable of resisting wind loads specified in Table R301.2(2) for walls using an effective wind area of 10 square feet and adjusted for height and exposure in accordance with Table R301.2(3). Vinyl soffit panels shall be installed using fasteners specified by the manufacturer and shall be fastened at both ends to a supporting component such as a nailing strip, fascia or subfascia component in accordance with Figure R704.2.1. Where the unsupported span of soffit panels is greater than 12 inches, intermediate nailing strips shall be provided in accordance with Figure R704.2.~~1~~2. Vinyl soffit panels shall be installed in accordance with the manufacturer's installation instructions. Fascia covers shall be installed in accordance with the manufacturer's installation instructions.					
RB235-19	**R703.3.1.1 Wood structural panel soffit.** The minimum nominal thickness for wood structural panel soffits shall be $^3/_8$ inch (9.5 mm) and shall be fastened to framing or nailing strips with 2-inch by 0.099-inch (51 mm × 2.5 mm) nails. Fasteners shall be ~~in~~ spaced not ~~less~~ greater than 6 inches (152 mm) on center at panel edges and 12 inches (305 mm) on center at intermediate supports.			X	Minimal	Clarification
RB237-19	**R703.4 Flashing.** Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. Fluid-applied membranes used as flashing in exterior walls shall comply with AAMA 714. The flashing shall extend to the surface of the exterior wall finish. Approved corrosion-resistant flashings shall be installed at the following locations: 1. Exterior window and door openings. Flashing at exterior window and door openings shall be installed in accordance with R703.4.1. ~~extend to the surface of the exterior wall finish or to the water-resistive barrier complying with Section 703.2 for subsequent drainage. Mechanically attached flexible flashings shall comply with AAMA 712. Flashing at exterior window and door openings shall be installed in accordance with one or more of the following:~~ 1.1. ~~The fenestration manufacturer's installation and flashing instructions, or for applications not addressed in the fenestration manufacturer's instructions, in accordance with the flashing manufacturer's instructions. Where flashing~~		X			Provides clarification of flashing requirements

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~instructions or details are not provided, pan flashing shall be installed at the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. Openings using pan flashing shall incorporate flashing or protection at the head and sides.~~ 1.2. ~~In accordance with the flashing design or method of a registered design professional.~~ 1.3. ~~In accordance with other approved methods.~~ 2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings. 3. Under and at the ends of masonry, wood or metal copings and sills. 4. Continuously above all projecting wood trim. 5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction. 6. At wall and roof intersections. 7. At built-in gutters. **R703.4.1 Flashing installation at exterior window and door openings.** Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier complying with Section 703.2 for subsequent drainage. Mechanically attached flexible flashings shall comply with AAMA 712. Flashing at exterior window and door openings shall be installed in accordance with one or more of the following: 1. The fenestration manufacturer's installation and flashing instructions, or for applications not addressed in the fenestration manufacturer's instructions, in accordance with the flashing manufacturer's instructions. Where flashing instructions or details are not provided, pan flashing shall be installed at the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the water resistive barrier for subsequent drainage. Openings using pan flashing shall incorporate flashing or protection at the head and sides. 2. In accordance with the flashing design or method of a registered design professional. 3. In accordance with other approved methods.					
RB238-19	**R703.4 Flashing.** Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	with AAMA 711. Fluid-applied membranes used as flashing in exterior walls shall comply with AAMA 714. The flashing shall extend to the surface of the exterior wall finish. Approved corrosion-resistant flashings shall be installed at the following locations: 1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier complying with Section 703.2 for subsequent drainage. ~~An insulation stop~~ Air sealing shall be installed around all window and door openings on the interior side of the rough opening gap., ~~1 to 2 inches inward from the face of the exterior sheathing, to allow for drainage of incidental water at the window or door flashing system.~~ Mechanically attached flexible flashings shall comply with AAMA 712. Flashing at exterior window and door openings shall be installed in accordance with one or more of the following: 1.1. The fenestration manufacturer's installation and flashing instructions, or for applications not addressed in the fenestration manufacturer's instructions, in accordance with the flashing manufacturer's instructions. Where flashing instructions or details are not provided, pan flashing shall be installed at the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. Openings using pan flashing shall incorporate flashing or protection at the head and sides. 1.2. In accordance with the flashing design or method of a registered design professional. 1.3. In accordance with other approved methods. 2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings. 3. Under and at the ends of masonry, wood or metal copings and sills. 4. Continuously above all projecting wood trim. 5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction. 6. At wall and roof intersections. 7. At built-in gutters.					
RB239-19	**R703.5 Wood, hardboard and wood structural panel siding.** Wood, hardboard, and wood structural panel siding shall be installed in accordance with this section and Table R703.3(1). Hardboard siding shall comply with CPA/ANSI A135.6. ~~Hardboard siding used as architectural trim shall comply with CPA/ANSI A 135.7.~~		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RB240-19	The title of the 2nd column in Tables R703.6.3(1), R703.6.3(2) and R905.7.5(2) was changed as follows: **Nail type, and minimum ~~shank diameter and~~ length and shank diameter (inches)**		X			Clarification
RB241-19	**R703.7.1 Lath.** Lath and lath attachments shall be of corrosion-resistant materials in accordance with ASTM C1063. expanded metal, welded wire, or woven wire lath. The lath shall be attached to wood framing members or furring. Where the exterior plaster is serving as wall bracing in accordance with Table R602.10.4, the lath shall be attached directly to framing. The lath shall be attached with $1^1/_2$-inch-long (38 mm), 11-gage nails having a $^7/_{16}$-inch (11.1 mm) head, or $^7/_8$-inch-long (22.2 mm), 16-gage staples, spaced not more than 7 inches (178 mm) on center along framing members or furring and not more than 24 inches on center between framing members or furring , or as otherwise approved. Additional fastening between wood framing members shall not be prohibited. Lath attachments to cold-formed steel framing or to masonry, stone, or concrete substrates shall be in accordance with ASTM C 1063. Where lath is installed directly over foam sheathing, lath connections shall also be in accordance with Sections R703.15, R703.16, or R703.17. Where lath is attached to furring installed over foam sheathing, the furring connections shall be in accordance with Sections R703.15, R703.16, or R703.17. **Exception:** Lath is not required over masonry, cast-in-place concrete, precast concrete or stone substrates prepared in accordance with ASTM C1063.		X			Clarification
RB242-19	**R703.7.3.1 Dry Climates.** In dry (B) climate zones indicated in Figure N1101.7, water-resistive barriers shall comply with one of the following: 1. The *water-resistive barrier* shall be two layers of 10-minute Grade D paper or have a water resistance equal to or greater than two layers of a *water-resistive barrier* complying with ASTM E2556, Type I. The individual layers shall be installed independently such that each layer provides a separate continuous plane. Flashing installed in accordance with Section R703.4 and intended to drain to the water-resistive barrier, shall be directed between the layers. 2. The water-resistive barrier shall be 60-minute Grade D paper or have a water resistance equal to or greater than one layer of a water-resistive barrier complying with ASTM E2556, Type II. The water-resistive barrier shall be separated from the stucco by a layer of foam plastic insulating sheathing or other non-water-absorbing layer, or a designed drainage space. **R703.7.3.2 Moist or marine climates.** In the moist (A) or marine (C) climate zones indicated in Figure N1101.7, water-resistive barriers shall comply with one of the following:			X		Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	1. In addition to complying with Section R703.7.3.1, a space or drainage material not less than 3/16 inch (5 mm) in depth shall be added to the exterior side of the water-resistive barrier. 2. In addition to complying with Section R703.7.3.1 Item 2, drainage on the exterior side of the water-resistive barrier shall have ~~a space having~~ a drainage efficiency of not less than 90%, as measured in accordance with ASTM E2273 or Annex A2 of ASTM E2925~~, shall be added to the exterior side of the *water-resistive barrier*~~.					
RB247-19	**R703.8.4 Anchorage.** Masonry veneer shall be anchored ~~directly~~ to the supporting wall studs with corrosion-resistant metal ties embedded in mortar or grout and extending into the veneer a minimum of $1^1/_2$ inches (38 mm), with not less than $^5/_8$-inch (15.9 mm) mortar or grout cover to outside face. Masonry veneer shall conform to Table R703.8.4(1). Where the masonry veneer tie attachment is fastened ~~directly~~ to wood structural panel not less than 7/16 performance category through insulating sheathing not greater than 2 inches (51 mm) in thickness, see Table R703.8.4(2). Where Table R703.8.4(2) is used, attachment to the ~~wood~~ studs behind the sheathing is not required.		X			Clarification
RB248-19	**TABLE R703.8.4(1)** **TIE ATTACHMENT AND AIRSPACE REQUIREMENTS** a. All fasteners shall have rust-inhibitive coating suitable for the installation in which they are being used, or be manufactured from material not susceptible to corrosion. b. An airspace that provides drainage shall be permitted to contain mortar from construction. c. In Seismic Design Category D0, D_1 or D_2, the minimum tie fastener shall be an 8d ring-shank nail (2 ½ in. x 0.131 in.) . d. Adjustable tie pintle shall include a minimum of 1 pintle leg of wire size W2.8 (MW18) with a maximum offset of 1-1/4 in. e. Adjustable tie pintle shall include a minimum of 2 pintle legs with a maximum offset of 1-1/4 in. Distance between inside face of brick and end of pintle shall be a maximum of 2 in. f. Adjustable tie backing attachment components shall consist of one of the following: eyes with minimum wire W2.8 (MW18), barrel with minimum 1/4 in. outside dia., or plate with minimum thickness of 0.074 in. and minimum width of 1-1/4 in.		X			Clarification
RB249-19	**R703.11.2 Installation over foam plastic sheathing.** Where vinyl siding or insulated vinyl siding is installed over foam plastic sheathing, the vinyl siding shall comply with Section R703.11 and shall have a wind load design ~~wind~~ pressure ~~resistance~~ rating in accordance with Table R703.11.2. **Exceptions:**		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	1. Where the foam plastic sheathing is applied directly over wood structural panels, fiberboard, gypsum sheathing or other *approved* backing capable of independently resisting the design wind pressure, the vinyl siding shall be installed in accordance with Sections R703.3.3 and R703.11.1. 2. Where the vinyl siding manufacturer's product specifications provide an approved wind load design ~~wind~~ pressure rating for installation over foam plastic sheathing, use of this wind load design ~~wind~~ pressure rating shall be permitted and the siding shall be installed in accordance with the *manufacturer's installation instructions*. 3. Where the foam plastic sheathing and its attachment have a design wind pressure resistance complying with Sections R316.8 and R301.2.1, the vinyl siding shall be installed in accordance with Sections R703.3.3 and R703.11.1. **TABLE R703.11.2** **~~ADJUSTED~~ REQUIRED MINIMUM WIND LOAD DESIGN ~~WIND~~ PRESSURE ~~REQUIREMENT~~ RATING FOR VINYL SIDING INSTALLED OVER FOAM PLASTIC SHEATHING ALONE** For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2, 1 mile per hour = 0.447 m/s, 1 pound per square foot = 0.0479 kPa. a. Linear interpolation is permitted. b. The table values are based on a maximum 30-foot mean roof height, and effective wind area of 10 square feet Wall Zone 5 (corner), and the ASD design component and cladding wind pressure from Table R301.2(2), adjusted for exposure in accordance with Table R301.2(3), multiplied by the following adjustment factors: ~~2.6~~ 1.87 (Case 1) and ~~3.7~~ 2.67 (Case 2) ~~for wind speeds less than 130 mph and 3.7 (Case 2) for wind speeds greater than 130 mph~~. c. Gypsum wallboard, gypsum panel product or equivalent. d. For the indicated wind speed condition~~,~~ and where foam sheathing is the only sheathing on the exterior of a frame walls with vinyl siding, ~~is not allowed unless the vinyl siding complies with an adjusted minimum design wind pressure requirement as determined in accordance with Note b and~~ the wall assembly ~~is~~ shall be capable of resisting an impact without puncture at least equivalent to that of a wood frame wall with minimum $^{7}/_{16}$-inch OSB sheathing as tested in accordance with ASTM E1886. The vinyl siding shall comply with an adjusted design wind pressure requirement in accordance with footnote b, using an adjustment factor of 2.67.					

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RB251-19	**TABLE R703.15.1** **CLADDING MINIMUM FASTENING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a]** b. The thickness of wood structural panels complying with the specific gravity requirement of footnote a shall be permitted to be included in satisfying the minimum penetration into framing. For cladding connections to wood structural panels, refer to Table R703.3.3. For brick veneer tie connections to wood structural panels, refer to Table R703.8.4(2).	X			Minimal	Clarification
RB252-19	**TABLE R703.16.2** **FURRING MINIMUM FASTENING REQUIREMENTS FOR APPLICATION OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a]** The modification fixes errors in to cells in Table R703.16.2. Added 15psf options for cladding.	X			Eliminates engineering cost	Clarification
RB253-19	**TABLE R703.15.2** **FURRING MINIMUM FASTENING REQUIREMENTS FOR APPLICATION OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a, b]** For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa, 1 pound per square inch = 6.895 kPa. DR = Design Required. o.c. = On Center. a. Wood framing and furring shall be Spruce-pine-fir or any wood species with a specific gravity of 0.42 or greater in accordance with AWC NDS. b. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths. c. The thickness of wood structural panels complying with the specific gravity requirement of footnote a shall be permitted to be included insatisfying the minimum required penetration into framing. d. Where the required cladding fastener penetration into wood material exceeds $^3/_4$ inch and is not more than $1^1/_2$ inches, a minimum 2 wood furring or an approved design shall be used. e. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C578 or ASTM C1289. f. Furring shall be spaced not more than 24 inches on center, in a vertical or horizontal orientation. In a vertical orientation, furring shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, the indicated 8-inch and 12-inch fastener spacing in furring shall be achieved by use of two fasteners into studs at 16 inches and 24 inches on center, respectively.	X			Minimal	Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RB254-19	**TABLE R703.16.1** **CLADDING MINIMUM FASTENING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT[a, b]** *(No change to table or footnotes not shown)* b. Where cladding is attached to wood structural panel sheathing only, fastening requirements shall be in accordance with Table R703.3.3. Where brick veneer ties are attached to wood structural panel sheathing only, fastening requirements shall be in accordance with Table R703.8.4(2).	X			Minimal	Clarification
RB255-19	**R802.1.5 Fire-retardant-treated wood.** Fire-retardant-treated wood (FRTW) is any wood product that, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E84 or UL 723, a listed flame spread index of 25 or less .In addition, the ASTM E84 or UL 723 test shall be continued for an additional 20-minutes and the flame front shall not progress more than 10.5 feet (3200 mm) beyond the center line of the burners at any time during the ~~extended 30-minute~~ test.		X			Clarification
RB257-19	**R802.1.5.2 Other means during manufacture.** For wood products ~~produced~~ impregnated with chemicals by other means during manufacture, the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product. The use of paints, coating, stains or other surface treatments is not an approved method of protection as required by this section.		X			Clarification
RB258-19	**R802.1.5.3 Testing.** For ~~wood products produced by other means during manufacture, other than a pressure process, all sides~~ fire retardant treated wood products the front and back faces of the wood product shall be tested in accordance with and produce the results required in Section R802.1.5. ~~Testing of only the front and back faces of wood structural panels shall be permitted.~~ **R802.1.5.3.1 Fire testing of wood structural panels.** Wood structural panels shall be tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm).			X		Adds fire safety and requires more testing for wood structural panels
RB260-19	**R802.4.2 Framing details.** Rafters shall be framed opposite from each other to a ridge board, shall not be offset more than $1^1/_2$ inches (38 mm) from each other and shall be connected with a collar tie or ridge strap in accordance with Section R802.4.6 or directly opposite from each other to a gusset plate in accordance with Table R602.3(1). Rafters shall be nailed to the top wall plates in accordance with Table R602.3(1) unless the roof assembly is required to comply with the uplift requirements of Section R802.11. **R802.4.6 Collar ties.** Where collar ties are used to connect opposing rafters, they shall be located in the upper third of the *attic* space and fastened in accordance with Table R602.3(1). Collar ties shall be not less		X			Clarification

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CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	than 1 inch by 4 inches (25 mm × 102 mm) nominal, spaced not more than 4 feet (1220 mm) on center. Ridge straps shall be permitted to replace collar ties. Ridge straps shall be not less than 1 1/4 inch (32 mm) x 20 gage and ~~shall extend a minimum of 12 inches (305 mm) onto rafters and shall~~ be nailed to the top edge of each rafter with a minimum of three 10d common (3" × 0.148") nails with the closest nail no closer than 2-3/8" from the end of the rafter ~~in accordance with manufacturers installation instructions~~. **R802.3 Ridge.** A ridge board used to connect opposing rafters shall be not less than 1 inch (25 mm) nominal thickness and not less in depth than the cut end of the rafter. Where ceiling joist or rafter ties do not provide continuous ties across the structure as required by Section R802.5.2, the ~~a~~ ridge shall be supported by a wall or ridge beam designed in accordance with accepted engineering practice ~~shall be provided~~ and supported on each end by a wall or column ~~girder~~. **R802.5 Ceiling joists.** Ceiling joists shall be continuous across the structure or securely joined where they meet over interior partitions in accordance with ~~Table R802.5.2~~ Section R802.5.2.1. Ceiling joists shall be fastened to the top plate in accordance with Table R602.3(1). **R802.5.2 Ceiling joist and rafter connections.** Where ceiling joists run parallel to rafters, and they are located ~~they shall be connected to rafters at the top wall plate in accordance with Table R802.5.2. Where ceiling joists are not connected to the rafters at the top wall plate, they shall be installed~~ in the bottom third of the rafter height, they shall be installed in accordance with Figure R802.4.5 and fastened to rafters in accordance with Table R802.5.2. Where the ceiling joists are installed above the bottom third of the rafter height, the ridge shall be designed as a beam in accordance with R802.3. Where ceiling joists do not run parallel to rafters, ~~the ceiling joists shall be connected to top plates in accordance with Table R602.3(1). Each~~ rafters shall be tied across the structure with a rafter tie in accordance with R802.5.2.2, or the ridge shall be designed as a beam in accordance					

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
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		Decrease	None	Increase		
Sub Code:						
RB261-19	with R802.3. ~~or a 2-inch by 4-inch (51 mm × 102 mm) kicker connected to the ceiling diaphragm with nails equivalent in capacity to Table R802.5.2.~~ **R802.5.2.1 Ceiling joists lapped.** Ends of ceiling joists shall be lapped not less than 3 inches (76 mm) or butted over bearing partitions or beams and toenailed to the bearing member. Where ceiling joists are used to provide the continuous tie across the building ~~resistance to rafter thrust~~, lapped joists shall be nailed together in accordance with Table R802.5.2 and butted joists shall be tied together with a connection of equivalent capacity ~~in a manner to resist such thrust~~. Laps in joists ~~Joists~~ that do not ~~resist thrust~~ provide the continuous tie across the building shall be permitted to be nailed in accordance with Table R602.3(1). ~~Wood structural panel roof sheathing, in accordance with Table R503.2.1.1(1), shall not cantilever more than 9 inches (229 mm) beyond the gable endwall unless supported by gable overhang framing.~~ **R802.5.2.2 Rafter ties.** Wood rafter ties shall be not less than 2 inches by 4 inches (51 mm × 102 mm) installed in accordance with Table R802.5.2 at ~~each~~ rafter a maximum of 24" o.c. Other approved rafter tie methods shall be permitted. **R802.5.2.3 Blocking.** Blocking shall be not less than utility grade lumber.		X			Clarification
RB262-19	**[Reserved under FBC]** **TABLE R802.5.2** **RAFTER/CEILING JOIST HEEL JOINT CONNECTIONS** [g] For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa. a. 10d common (3" × 0.148") nails shall be permitted to be substituted for 16d common (3-1/2"x 0.162") nails where the required number of nails is taken as 1.2 times the required number of 16d common nails, rounded up to the next full nail. b. Heel joint connections are not required where the ridge is supported by a load-bearing wall, header or ridge beam. c. Where intermediate support of the rafter is provided by vertical struts or purlins to a load-bearing wall, the tabulated heel joint connection requirements shall be permitted to be reduced proportionally to the reduction in span. d. Equivalent nailing patterns are required for ceiling joist to ceiling joist lap splices. e. Applies to roof live load of 20 psf or less. f. Tabulated heel joint connection requirements assume that ceiling joists or rafter ties are located at the bottom of the attic space. Where ceiling joists or rafter ties are located higher in the attic, heel joint connection requirements shall be increased by the following factors: where:		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
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		Decrease	None	Increase		
Sub Code:						
	H_C = Height of ceiling joists or rafter ties measured vertically ~~above~~ from the top of the rafter support walls to the bottom of the ceiling joists or rafter ties. H_R = Height of roof ridge measured vertically ~~above~~ from the top of the rafter support walls to the bottom of the roof ridge. Where H_C / H_R exceeds 1/3, connections shall be designed in accordance with accepted engineering practice. g. Tabulated requirements are based on 10 psf roof dead load in combination with the specified roof snow load and roof live load.					
RB263-19	**[Reserved under FBC]** **R802.5.2.1 Ceiling joists lapped.** Ends of ceiling joists shall be lapped not less than 3 inches (76 mm) or butted over bearing partitions or beams and toenailed to the bearing member. Where ceiling joists are used to provide resistance to rafter thrust, lapped joists shall be nailed together in accordance with Table R802.5.2 and butted joists shall be tied together in a manner to resist such thrust. Joists that do not resist thrust shall be permitted to be nailed in accordance with Table R602.3(1). ~~Wood structural panel roof sheathing, in accordance with Table R503.2.1.1(1), shall not cantilever more than 9 inches (229 mm) beyond the gable endwall unless supported by gable overhang framing.~~		X			Clarification
RB264-19	**[Reserved under FBC]** **R802.6 Bearing.** The ends of each rafter or ceiling joist shall have not less than $1^1/_2$ inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on masonry or concrete. The bearing on masonry or concrete shall be direct, or a sill plate of 2-inch (51 mm) minimum nominal thickness shall be provided under the rafter or ceiling joist. The sill plate shall provide a minimum nominal bearing area of 48 square inches (30 865 mm^2). Where the roof pitch is greater than or equal to 3:12 (25% slope), and ceiling joists or rafter ties are connected to rafters to provide a continuous tension tie in accordance with Section R802.5.2, vertical bearing of the top of the rafter against the ridge board shall satisfy this bearing requirement.		X			Clarification
RB265-19	**[Reserved under FBC]** **R802.11 Roof tie-down.** **R802.11.1 Uplift resistance.** Roof assemblies shall have uplift resistance in accordance with Sections R802.11.1.1 and R802.11.1.2. **Exception:** ~~Where the uplift force does not exceed 200 pounds (90.8 kg), rafters and trusses spaced not more than 24 inches (610 mm) on center~~ Rafters or trusses shall be permitted to be attached to their supporting wall assemblies in accordance with Table R602.3(1) where either of the following occur: 1. Where the uplift force per rafter or truss does not exceed 200 pounds (90.8 kg) as determined by Table R802.11.		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	2. Where the basic wind speed does not exceed 115 mph, the wind exposure category is B, the roof pitch is 5:12 (42-percent slope) or greater, ~~and~~ the roof span is 32 feet (9754 mm) or less, and rafters and trusses are spaced not more than 24 inches (610 mm) on center ~~shall be permitted to be attached to their supporting wall assemblies in accordance with Table R602.3(1)~~. **R802.11.1.1 Truss uplift resistance.** Trusses shall be attached to supporting wall assemblies by connections capable of resisting uplift forces as specified on the truss design drawings for the ultimate design wind speed as determined by Figure R301.2(5)A and listed in Table R301.2(1) or as shown on the construction documents. Uplift forces shall be permitted to be determined as specified by Table R802.11, if applicable, or as determined by accepted engineering practice. **R802.11.1.2 Rafter uplift resistance.** Individual rafters shall be attached to supporting wall assemblies by connections capable of resisting uplift forces as determined by Table R802.11 or as determined by accepted engineering practice. Connections for beams used in a roof system shall be designed in accordance with accepted engineering practice.					
RB266-19	**[Reserved under FBC]** **TABLE R804.3** **ROOF FRAMING FASTENING SCHEDULE[a, b]** For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 mil = 0.0254 mm. a. Screws are a minimum No. 10 unless noted otherwise. b. Indicated number of screws shall be applied through the flanges of the truss or ceiling joist or through each leg of a 54 mil clip angle. See Section R804.3.8 for additional requirements to resist uplift forces. **TABLE R804.3.2.1(2)** **ULTIMATE DESIGN WIND SPEED TO EQUIVALENT SNOW LOAD CONVERSION** For SI: 1 mile per hour = 0.447 m/s, 1 pound per square foot = 0.0479 kPa. **R804.3.2.1.2 Rake overhangs.** Rake overhangs shall not exceed ~~12 inches (305 mm) measured horizontally.~~ the limitations provided for Option #1 or Option #2 in Figure R804.3.2.1.2. Outlookers at gable endwalls shall be installed in accordance with Figure R804.3.2.1.2. The required strength for uplift connectors required for Option #1 shall be determined in accordance with AISI S230 Table F3-4.			X	Minimal	Clarification

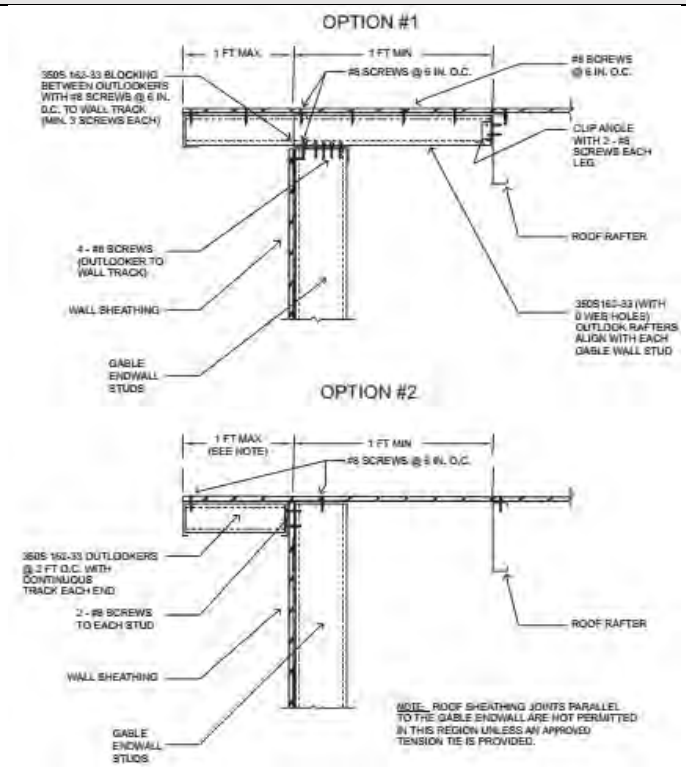
Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	 For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm. **FIGURE R804.3.2.1.2** **GABLE ENDWALL OVERHANG DETAILS** **R804.3.2.5 Roof rafter bottom flange bracing.** The bottom flanges of roof rafters shall be continuously braced, at a maximum spacing ~~of 8~~ of 4 feet (2440 mm) as measured parallel to the roof rafters, with one of the following members: 1. Minimum 33-mil (0.84 mm) C-shaped member. 2. Minimum 33-mil (0.84 mm) track section. 3. Minimum 11/2-inch by 33-mil (38 mm by 0.84 mm) steel strap. The bracing element shall be fastened to the bottom flange of each roof rafter with one No. 8 screw and shall be fastened to blocking with two No. 8 screws. Blocking shall be installed between roof rafters in-line with the continuous bracing at a maximum spacing of 12 feet (3658 mm) measured perpendicular to the roof rafters. The ends of continuous bracing shall be fastened to blocking or anchored to a stable building component with two No. 8 screws.					
RB267-19	**R805.1 Ceiling installation.** Ceilings shall be installed in accordance with the requirements for interior wall finishes as provided in ~~Section R702.~~Sections R702.1 through R702.6		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	**2021 IRC STRUCTURAL CHANGES SUMMARY**	**IRC COST IMPACT**			**ESTIMATED AMOUNT***	**BENEFIT OF CHANGE**
		Decrease	**None**	**Increase**		
Sub Code:						
RB268-19	**SECTION R806** **ROOF VENTILATION** **R806.1 Ventilation required.** Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. Ventilation openings shall have a least dimension of $^1/_{16}$ inch (1.6 mm) minimum and $^1/_4$ inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than $^1/_4$ inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material with openings having a least dimension of $^1/_{16}$ inch (1.6 mm) minimum and $^1/_4$ inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of Section R802.7. Required ventilation openings shall open directly to the outside air and shall be protected to prevent the entry of birds, rodents, snakes and other similar creatures. **R806.5 Unvented attic and unvented enclosed rafter assemblies.** Unvented *attics* and unvented enclosed roof framing assemblies created by ceilings that are applied directly to the underside of the roof framing members and structural roof sheathing applied directly to the top of the roof framing members/rafters, shall be permitted where all the following conditions are met: 1. The unvented *attic* space is completely within the *building thermal envelope*. 2. Interior Class I vapor retarders are not installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed roof framing assembly. 3. Where wood shingles or shakes are used, a minimum $^1/_4$-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing underlayment above the structural sheathing. 4. In Climate Zones 5, 6, 7 and 8, any *air-impermeable insulation* shall be a Class II vapor retarder, or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation. 5. Insulation shall comply with Item 5.3 and either Item 5.1 or 5.2: 5.1. Item 5.1.1, 5.1.2, 5.1.3 or 5.1.4 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing. 5.1.1. Where only *air-impermeable insulation* is provided, it shall be applied in direct contact with the underside of the structural roof sheathing. 5.1.2. Where *air-permeable insulation* is installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural	X			Minimal depending on construction type	Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	roof sheathing in accordance with the *R*-values in Table R806.5 for condensation control. 5.1.3. Where both *air-impermeable* and *air-permeable insulation* are provided, the *air-impermeable insulation* shall be applied in direct contact with the underside of the structural roof sheathing in accordance with Item 5.1.1 and shall be in accordance with the *R*-values in Table R806.5 for condensation control. The *air-permeable insulation* shall be installed directly under the *air-impermeable insulation*. 5.1.4. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45°F (7°C). For calculation purposes, an interior air temperature of 68°F (20°C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months. 5.2. In Climate Zones 1, 2 and 3, air-permeable insulation installed in unvented *attics* shall meet the following requirements: 5.2.1. An approved *vapor diffusion port* shall be installed not more than 12 inches (305 mm) from the highest point of the roof, measured vertically from the highest point of the roof to the lower edge of the port. 5.2.2. The port area shall be greater than or equal to 1:600 of the ceiling area. Where there are multiple ports in the attic, the sum of the port areas shall be greater than or equal to the area requirement. 5.2.3. The vapor-permeable membrane in the *vapor diffusion port* shall have a vapor permeance rating of greater than or equal to 20 perms when tested in accordance with Procedure A of ASTM E96. 5.2.4. The *vapor diffusion port* shall serve as an air barrier between the *attic* and the exterior of the building. 5.2.5. The *vapor diffusion port* shall protect the *attic* against the entrance of rain and snow. 5.2.6. Framing members and blocking shall not block the free flow of water vapor to the port. Not less than a 2-inch (51 mm) space shall be provided between any blocking and the roof sheathing. Air-permeable insulation shall be permitted within that space. 5.2.7. The roof slope shall be greater than or equal to 3:12 (vertical/horizontal).					

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	5.2.8. Where only air-permeable insulation is used, it shall be installed directly below the structural roof <u>sheathing, on top of the attic floor, or on top of the ceiling</u>. 5.2.9. *Air-impermeable insulation*, ~~if any~~<u>where used in conjunction with air-permeable insulation</u>, shall be directly above or below the structural roof sheathing and is not required to meet the *R*-value in Table 806.5. Where directly below the structural roof sheathing, there shall be no space between the *air-impermeable insulation* and air-permeable insulation. 5.2.10. ~~The~~ <u>Where air-permeable insulation is used and is installed directly below the roof structural sheathing,</u> air shall be supplied at a flow rate greater than or equal to 50 CFM (23.6 L/s) per 1,000 square feet (93 m^2) of ceiling. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating. Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating. **<u>Exceptions:</u>** <u>1. Where both air-impermeable and air-permeable insulation are used, and the R-value in Table 806.5 is met, air supply to the attic is not required.</u> <u>2. Where only air-permeable insulation is used and is installed on top of the attic floor, or on top of the ceiling, air supply to the attic is not required.</u> 5.3. Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.					

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RB271-19	**SECTION R806** **ROOF VENTILATION** **R806.1 Ventilation required.** Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. Ventilation openings shall have a least dimension of $^1/_{16}$ inch (1.6 mm) minimum and $^1/_4$ inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than $^1/_4$ inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material with openings having a least dimension of $^1/_{16}$ inch (1.6 mm) minimum and $^1/_4$ inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of Section R802.7. Required ventilation openings shall open directly to the outside air and shall be protected to prevent the entry of birds, rodents, snakes and other similar creatures. **R806.5 Unvented attic and unvented enclosed rafter assemblies.** Unvented *attics* and unvented enclosed roof framing assemblies created by ceilings that are applied directly to the underside of the roof framing members and structural roof sheathing applied directly to the top of the roof framing members/rafters, shall be permitted where all the following conditions are met: 1. The unvented *attic* space is completely within the *building thermal envelope*. 2. Interior Class I vapor retarders are not installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed roof framing assembly. 3. Where wood shingles or shakes are used, a minimum $^1/_4$-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing underlayment above the structural sheathing. 4. In Climate Zones 5, 6, 7 and 8, any *air-impermeable insulation* shall be a Class II vapor retarder, or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation. 5. Insulation shall comply with Item 5.3 and either Item 5.1 or 5.2: 5.1. Item 5.1.1, 5.1.2, 5.1.3 or 5.1.4 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing. 5.1.1. Where only *air-impermeable insulation* is provided, it shall be applied in direct contact with the underside of the structural roof sheathing. 5.1.2. Where *air-permeable insulation* is installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof	X			Minimal depending on construction type	Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	sheathing in accordance with the *R*-values in Table R806.5 for condensation control. 5.1.3. Where both *air-impermeable* and *air-permeable insulation* are provided, the *air-impermeable insulation* shall be applied in direct contact with the underside of the structural roof sheathing in accordance with Item 5.1.1 and shall be in accordance with the *R*-values in Table R806.5 for condensation control. The *air-permeable insulation* shall be installed directly under the *air-impermeable insulation*. 5.1.4. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45°F (7°C). For calculation purposes, an interior air temperature of 68°F (20°C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months. 5.2. In Climate Zones 1, 2 and 3, air-permeable insulation installed in unvented *attics* shall meet the following requirements: 5.2.1. An approved *vapor diffusion port* shall be installed not more than 12 inches (305 mm) from the highest point of the roof, measured vertically from the highest point of the roof to the lower edge of the port. 5.2.2. The port area shall be greater than or equal to 1:600 of the ceiling area. Where there are multiple ports in the attic, the sum of the port areas shall be greater than or equal to the area requirement. 5.2.3. The vapor-permeable membrane in the *vapor diffusion port* shall have a vapor permeance rating of greater than or equal to 20 perms when tested in accordance with Procedure A of ASTM E96. 5.2.4. The *vapor diffusion port* shall serve as an air barrier between the *attic* and the exterior of the building. 5.2.5. The *vapor diffusion port* shall protect the *attic* against the entrance of rain and snow. 5.2.6. Framing members and blocking shall not block the free flow of water vapor to the port. Not less than a 2-inch (51 mm) space shall be provided between any blocking and the roof sheathing. Air-permeable insulation shall be permitted within that space. 5.2.7. The roof slope shall be greater than or equal to 3:12 (vertical/horizontal).					

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	5.2.8. Where only air-permeable insulation is used, it shall be installed directly below the structural roof sheathing, on top of the attic floor, or on top of the ceiling. 5.2.9. *Air-impermeable insulation*, ~~if any~~where used in conjunction with air-permeable insulation, shall be directly above or below the structural roof sheathing and is not required to meet the *R*-value in Table 806.5. Where directly below the structural roof sheathing, there shall be no space between the *air-impermeable insulation* and air-permeable insulation. 5.2.10. ~~The~~ Where air-permeable insulation is used and is installed directly below the roof structural sheathing, air shall be supplied at a flow rate greater than or equal to 50 CFM (23.6 L/s) per 1,000 square feet (93 m^2) of ceiling. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating. Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating. **Exceptions:** 1. Where both air-impermeable and air-permeable insulation are used, and the R-value in Table 806.5 is met, air supply to the attic is not required. 2. Where only air-permeable insulation is used and is installed on top of the attic floor, or on top of the ceiling, air supply to the attic is not required. 5.3 Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.					
RB274-19	**R905.1.1 Underlayment.** *Underlayment* for asphalt shingles, clay and concrete tile, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, metal roof panels and *photovoltaic shingles* shall conform to the applicable standards listed in this chapter. *Underlayment* materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a label indicating compliance to the standard designation and, if applicable, type classification indicated in Table R905.1.1(1). *Underlayment* shall be applied in accordance with Table R905.1.1(2). *Underlayment* shall be attached in accordance with Table R905.1.1(3). **Exceptions:** 1. As an alternative, self-adhering polymer-modified bitumen underlayment bearing a label indicating compliance to ASTM D1970, and installed in accordance with both the underlayment manufacturer's and roof covering manufacturer's instructions for the		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	deck material, roof ventilation configuration and climate exposure for the roof covering to be installed, shall be permitted. 2. As an alternative, a minimum 4-inch-wide (102 mm) strip of self-adhering polymer-modified bitumen membrane bearing a label indicating compliance to complying with ASTM D1970, installed in accordance with the manufacturer's installation instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment complying with Table R905.1.1(1) for the applicable roof covering for maximum ultimate design wind speeds, Vult, less than 140 miles per hour shall be applied over the entire roof over the 4-inch-wide (102 mm) membrane strips. Underlayment shall be applied in accordance with Table R905.1.1(2) using the application requirements for areas where wind design is not required in accordance with Figure R301.2(4)B. Underlayment shall be attached in accordance with Table R905.1.1(3). 3. As an alternative, two layers of underlayment complying with ASTM D226 Type II or ASTM D4869 Type III or Type IV shall be permitted to be installed as follows in 3.1–3.4: 3.1. Apply a 19-inch-wide (483 mm) strip of underlayment parallel with the eave. Starting at the eave, apply 36-inch-wide (914 mm) strips of underlayment felt, overlapping successive sheets 19 inches (483 mm). End laps shall be 4 inches (102 mm) and shall be offset by 6 feet (1829 mm). 3.2. The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at side and end laps. 3.3. Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch (25 mm). Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25 mm). Minimum thickness of the outside edge of plastic caps shall be 0.035 inch (0.89 mm). 3.4.The cap nail shank shall be not less than 0.083 inch (2.11 mm) for ring shank cap nails and 0.091 inch (2.31 mm) for smooth shank cap nails. Cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch (19 mm) into the roof sheathing.					

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
RB275-19	**R905.1.1 Underlayment.** *Underlayment* for asphalt shingles, clay and concrete tile, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, metal roof panels and *photovoltaic shingles* shall conform to the applicable standards listed in this chapter. *Underlayment* materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a label indicating compliance to the standard designation and, if applicable, type classification indicated in Table R905.1.1(1). *Underlayment* shall be applied in accordance with Table R905.1.1(2). *Underlayment* shall be attached in accordance with Table R905.1.1(3). **Exceptions:** 1. As an alternative, self-adhering polymer-modified bitumen *underlayment* complying with ASTM D1970 installed in accordance with both the *underlayment* manufacturer's and roof covering manufacturer's instructions for the deck material, roof ventilation configuration and climate exposure for the roof covering to be installed, shall be permitted. 2. As an alternative, a minimum 4-inch-wide (102 mm) strip of self-adhering polymer-modified bitumen membrane complying with ASTM D1970, installed in accordance with the *manufacturer's installation instructions* for the deck material, shall be applied over all joints in the roof decking. An *approved underlayment* for the applicable roof covering for ~~maximum ultimate design wind speeds, V_{ult}, less than 140 miles per hour~~ areas where wind design is not required in accordance with Figure R301.2(4)B shall be applied over the entire roof over the 4-inch-wide (102 mm) membrane strips. 3. ~~As an alternative, two layers of *underlayment* complying with ASTM D226 Type II or ASTM D4869 Type III or Type IV shall be permitted to be installed as follows in 3.1–3.4:~~ 3.1. ~~Apply a 19-inch-wide (483 mm) strip of *underlayment* parallel with the eave. Starting at the eave, apply 36-inch-wide (914 mm) strips of *underlayment* felt, overlapping successive sheets 19 inches (483 mm). End laps shall be 4 inches (102 mm) and shall be offset by 6 feet (1829 mm).~~ 3.2. ~~The *underlayment* shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at side and end laps.~~ 3.3. ~~*Underlayment* shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch (25 mm). Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25 mm). Minimum thickness of the outside edge of plastic caps shall be 0.035 inch (0.89 mm).~~			X	$0.10 per Sqft. minimum	Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	3.4. ~~The cap nail shank shall be not less than 0.083 inch (2.11 mm) for ring shank cap nails and 0.091 inch (2.31 mm) for smooth shank cap nails. Cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than $^{3}/_{4}$ inch (19 mm) into the roof sheathing.~~ **TABLE R905.1.1(1)** **UNDERLAYMENT TYPES** **TABLE R905.1.1(2)** **UNDERLAYMENT APPLICATION** **TABLE R905.1.1(3)** **UNDERLAYMENT APPLICATION**					
RB277-19	**R905.3.1 Deck requirements.** Concrete and clay tile shall be installed only over solid ~~structural~~ sheathing ~~boards~~. **Exception:** Spaced lumber sheathing in accordance with Section R803.1 shall be permitted in Seismic Design Categories A, B and C.		X			Clarification
RB278-19	**R905.3.6 Fasteners.** Nails shall be corrosion resistant and not less than 11-gage, [0.120 inch (3 mm)] $^{5}/_{16}$-inch (11 mm) head, and of sufficient length to penetrate the deck not less than $^{3}/_{4}$ inch (19 mm) or through the thickness of the deck, whichever is less. Attaching wire for clay or concrete tile shall not be smaller than 0.083 inch (2 mm). Perimeter fastening areas include three tile courses but not less than 36 inches (914 mm) from either side of hips or ridges and edges of eaves and gable rakes.		X			Clarification
RB279-19	**TABLE R905.4.4.1** **CLASSIFICATION OF STEEP SLOPE METAL ROOF SHINGLES TESTED IN ACCORDANCE WITH ASTM D3161 ~~OR D7158~~** For SI: 1 foot = 304.8 mm; 1 mile per hour = 0.447 m/s. ~~a. The standard calculations contained in ASTM D7158 assume Exposure Category B or C and a building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.~~		X			Clarification
RB283-19	**R906.1 General.** ~~The use of~~ Where above-deck thermal insulation is installed, such insulation shall be ~~permitted provided that such insulation is~~ covered with an *approved* roof covering and ~~complies with FM 4450~~ shall comply with NFPA 276 or UL 1256. **NFPA** 276-15: Standard Method of Fire Tests for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-deck Roofing Components		X			Replaces FM4450 with NFPA 276 for roof insulation
S184-19 Part II	**R602.6 Drilling and notching of studs.** Drilling and notching of studs shall be in accordance with the following: 1. Notching. ~~Any~~ A stud in an exterior wall or bearing partition shall ~~be permitted to~~ not be cut or notched to a depth ~~not~~ exceeding 25 percent of its ~~width.~~ depth. Studs in nonbearing partitions shall		X			Clarification

Table 11. 2021 IRC STRUCTURAL Changes Cost Impact						
CODE CHANGE #	2021 IRC STRUCTURAL CHANGES SUMMARY	IRC COST IMPACT			ESTIMATED AMOUNT*	BENEFIT OF CHANGE
		Decrease	None	Increase		
Sub Code:						
	~~be permitted to~~ not be notched to a depth ~~not to exceed~~ exceeding 40 percent of a single stud ~~width.~~ depth. 2. ~~Drilling. Any stud shall be permitted to be bored or drilled, provided that the diameter of the resulting hole is not more than 60~~ Boring. The diameter of bored holes in studs shall not exceed 60 percent of the stud ~~width~~ depth, the edge of the hole ~~is~~ shall not ~~more~~ be less than $^{5}/_{8}$ inch (16 mm) ~~to~~ from the edge of the stud, and the hole ~~is~~ shall not be located in the same section as a cut or notch. ~~Studs~~ Where the diameter of a bored hole in a stud located in exterior walls or bearing partitions ~~drilled~~ is over 40 percent ~~and up to 60 percent~~ such stud shall be doubled ~~with~~ and not more than two successive doubled studs shall be so bored. See Figures R602.6(1) and R602.6(2). **Exception:** ~~Use of~~ Where *approved* stud shoes ~~is permitted where they~~ are installed in accordance with the manufacturer's ~~recommendations.~~ instructions.					

APPENDIX L
DISCLAIMER
Probable Construction Costs Opinions

Assumptions

This Estimate is not a guarantee of Final Bid Cost or of Final Project Cost.
This is an Opinion of Probable Cost of Mechanical, Electrical, and Piping (M.E.P.) Systems for the proposed buildings.

- The estimate was compiled using documents provided by various sources.
- The estimate is representative of average unit pricing and labor from historical job costs of similar type, cost and labor data from Mechanical Contractors Association of America (MCAA), CostWorks 2015 Qtr. 2 (Change Date and Qtr) by R.S. Means Company Inc, National Electrical Contractors Association (NECA) and Sheet Metal Estimating by Herbert C. Wendes.
- The subcontractor unit rates include the subcontractor's overhead and profit, unless otherwise stated.
- The mark-ups included in the unit prices cover the cost of field overhead, home office overhead and profit, and range from 15% to 25% of the costs of a particular item.

Since we have no control over the cost of labor, material and equipment, or the contractor's method of carrying out the work and determining the price, or over competitive bidding or market conditions, this opinion of probable construction cost provided is made on the basis of experience and qualifications. This opinion represents our best judgment as professional construction consultants with the Construction Industry. However, we cannot and do not guarantee that proposals, bids or the construction cost will not vary from the opinions of probable cost in this estimate.

General Assumptions:

- "Allowances" are considered to be an allotted sum of money for a particular system or scope of work for which sufficient detail is not available to determine a definitive cost.
- These cost allowances are included to project a final cost to include labor, material, equipment and any subcontractor costs.
- The owner receives the savings for any amount under the allowance and is at risk for any amount over the allowance.
- The estimate is in today's dollars, and has been adjusted to the local area.
- This estimate does not include any fees or permits.
- This estimate is intended to reflect construction costs only.
- This estimate is intended to reflect normal construction schedules only.
- Variations in material costs, labor efficiencies, wage rates, union practices, and bid climate will effect final costs.
- Workers will report to the actual job site.
- Materials delivered to the actual job site will need to be scheduled.
- No premium or overtime has been included.
- No General Construction costs have been included.
- All utilities have sufficient capacity for the added loads.