



SIGNIFICANT CHANGES TO THE

CALIFORNIA FIRE CODE

2019 EDITION

SIGNIFICANT CHANGES TO THE CALIFORNIA FIRE CODE

2019 EDITION

Kevin Reinertson, Author

Kevin H. Scott, Author

Additional contributions by Robert A. Neale

International Code Council

ICC Staff :

Executive Vice President and Director of Business
Development: Mark A. Johnson

Senior Vice President, Business and Product
Development: Hamid Naderi

Vice President and Technical Director of Products
and Services: Doug Thornburg

Vice President, Publishing and Multimedia:
Margaret Leddin

Senior Marketing Specialist: Dianna Hallmark

ISBN: 978-1-60983-884-3

Cover Design: Julia Lange

Manager of Development: Hamid Naderi

Publications Manager: Anne Kerr

Project Editor: Sharon Gordy

COPYRIGHT © 2019

by International Code Council, Inc.

ALL RIGHTS RESERVED.



This publication is a copyrighted work owned by the International Code Council, Inc ("ICC"). Without advance written permission from the copyright owner, no part of this book may be reproduced, distributed or transmitted in any form or by any means, including, without limitation, electronic, optical or mechanical means (by way of example, and not limitation, photocopying or recording by or in an information storage retrieval system). For information on use rights and permissions, please contact: ICC Publications, 4051 Flossmoor Road, Country Club Hills, IL 60478. Phone 1-888-ICC-SAFE (422-7233).

The information contained in this document is believed to be accurate; however, it is being provided for informational purposes only and is intended for use only as a guide. Publication of this document by the ICC should not be construed as the ICC engaging in or rendering engineering, legal or other professional services. Use of the information contained in this book should not be considered by the user to be a substitute for the advice of a registered professional engineer, attorney or other professional. If such advice is required, it should be sought through the services of a registered professional engineer, licensed attorney or other professional.

Trademarks: "International Code Council," the "International Code Council" logo, "ICC", the "ICC" logo and other names and trademarks appearing in this book are registered trademarks of International Code Council, Inc., and/or its licensors (as applicable), and may not be used without permission.

Errata on various ICC publications may be available at www.iccsafe.org/errata.

First Printing: August 2019

PRINTED IN THE USA

Contents



PART 1

Administration Chapters 1 and 2

- 1.1.7.3.1
Application of the CBC vs. CRC
- 1.11.6
Certificate of Occupancy Group R-3
and U Exemptions
- 202
Care Suite
- 202
Community Care Facility
- 202
Congregate Living Health Facility (CLHF)
- 202
Foster Family Home
- 202
Non-patient Care Suite
- 202
Occupancy Classification:
Residential Group R-2.2 (CDCR Only)

PART 2

General Safety Provisions Chapters 3 and 4

- 314.4
Indoor Display of Vehicles

1

2

3

4

5

7

9

12

13

19

20

- 315.3.1
Ceiling Clearance for Indoor Storage 22
- 315.1, 315.7, 105.6.29
Outdoor Pallet Storage 24
- 403.12.3, 403.12.3.1
Crowd Managers 28
- 404.2.3, 404.2.3.1, 404.2.3.2, 404.2.3.3
Lockdown Plans 30

PART 3

Building and Equipment Design Features Chapters 5 through 12 33

- 510
Emergency Responder Radio Coverage 37
- 603.1, 603.3
Fuel-fired Appliances 39
- 605.11, 608
Solar Photovoltaic Power Systems
and Stationary Storage Battery Systems 42
- 605.13, 605.16, 605.17
Refrigerants with Lower Flammability
Hazards 43
- 608.3
Nonmetallic Cooking Oil Storage Tanks 47
- 804.3.3.1, 804.3.3.2, 804.3.3.3
Group I-2 and Group I-3 Floor Surfaces 48

■ 807.1, 807.2, 807.5 Combustible Decorative Materials	50	■ 907.1.2 Fire Alarm Construction Documents	88
■ 807.4 Artificial Decorative Vegetation	52	■ 907.2.1 Fire Alarms in Group A Occupancies	89
■ 901.4.6.1, 901.4.6.2, 901.4.6.3, 901.4.6.4 Fire Pump and Fire Sprinkler Riser Rooms	54	■ 907.2.10 (deleted) Group R-4 Fire Alarm System	91
■ 901.6.2 Integrated Fire Protection System Testing	55	■ 907.5.1, 907.5.2.2, 907.5.2.5 Group I-2 and I-2.1 Occupancy Fire Alarms	93
■ 901.8.2 Removal of Occupant-use Hose Lines	57	■ 907.5.2.2.4 Emergency Voice/Alarm Communication System Captions	95
■ 903.2.1 Sprinklers in Group A Occupancies	58	■ 907.6.1.1 High-rise Buildings Wiring for Fire Alarm Network Communication Circuits	96
■ 903.2.3 Sprinklers in Group E Occupancies	61	■ 909.5.3, 909.5.3.1 Door Opening Protectives for Buildings with Smoke Control Systems	97
■ 903.2.16, 903.2.16.1, 903.2.5.4, 907.2.28, 907.2.28.1, 907.6.4 Group L Occupancies	63	■ 910.5 Maintenance of Smoke and Heat Removal Equipment	99
■ 903.3.1.1.2 Sprinklers in Bathrooms in Group R Occupancies	67	■ 915.2.3, 915.4.2 Carbon Monoxide Detection in Group E Occupancies	101
■ 903.3.1.2.1 Sprinklers Beneath Balconies	68	■ 916 Gas Detection Systems	102
■ 903.3.1.2.3 Protection of Attics in Group R Occupancies	70	■ Table 1004.5, 1004.8 Occupant Load Calculation in Business Use Areas	105
■ 903.3.3 Sprinkler Obstructions	73	■ 1005.3.1 Stairway Width for Group A Occupancies	107
■ 904.12 Commercial Cooking Operations	74	■ 1006.2.1 Spaces with One Exit or Exit Access Doorway	109
■ 904.13 Domestic Cooking in Institutional Occupancies	76	■ 1006.2.1, Table 1006.2.1, 1008.3.2, 1020.1, 1024.6 Means of Egress in Group I-2 and I-2.1 Care Facilities	112
■ 904.14, Table 901.6.1 Aerosol Fire-extinguishing Systems	78	■ 1006.2.2.6, 1006.2.1, 1017.2 Groups R-3 and R-4 Protected with NFPA 13D Sprinkler System	116
■ 905.3.1 Class III Standpipes	80	■ 1006.3, 1006.3.1 Exits on Adjacent Stories	119
■ 905.3.10 Group I-3	83	■ 1008.2.3 Illumination of the Exit Discharge	121
■ 905.4 Class I Standpipe Hose Connections	84	■ 1008.3.5, 1008.2.2 Emergency Illumination in Group I-2	123
■ 905.11 Locking Caps on Standpipe Outlets	86		
■ 906.1 Portable Fire Extinguishers	87		

■	1009.7.2 Protection of Exterior Areas of Assisted Rescue	125	■	1031.2.2 Locking Arrangements in Existing Educational Occupancies	167
■	1010.1.1 Size of Doors	127	■	1031.4 Exit Signs in Existing Buildings	169
■	1010.1.4.4 Locking Arrangements in Educational Occupancies	130	■	1031.10 Inspection and Testing of Emergency Egress Lighting	170
■	1010.1.9.8, 1010.1.9.8.1 Delayed Egress	132	■	1103.5.1 Fire Sprinklers in Existing Group A-2 Occupancies	171
■	1010.1.9.9, 1010.1.9.10 Electrically Locked Egress Doors	135	■	1103.9 Carbon Monoxide Alarms in Existing Buildings	174
■	1010.1.9.12 Locks on Stairway Doors	138	■	1104.16.2 Wall Openings Adjacent to Fire Escapes	175
■	1010.1.10 Panic Hardware and Fire Exit Hardware	140	■	1105.6.2 Fire-protection-rated Doors in Existing Group I-2	176
■	1010.3 Turnstiles	142	■	Chapter 12 Energy Systems	177
■	1011.6 Stairway Landings	145	■	1204.5 Rapid Shutdown for Solar Photovoltaic Power Systems	180
■	1015.6, 1015.7 Fall Arrest for Rooftop Equipment	147	■	1206.2 Stationary Storage Battery Systems	183
■	1017.3 Common Path of Egress Travel	149	PART 4 Special Occupancies Chapters 20 through 39 189		
■	1023.3.1 Stairway Extension	151	■	Chapter 22 Combustible Dust	191
■	1023.5, 1024.6 Exit Stairway and Exit Passageway Penetrations	153	■	2303.2.1 Height of Emergency Disconnect Switch	193
■	1025.1 Luminous Egress Path Marking in Group I Occupancies	155	■	2306.7.3.1 Protection from Vehicle Impact	194
■	1026.4, 1026.4.1 Refuge Areas for Horizontal Exits	156	■	2309.6, 2309.6.1 Defueling of Hydrogen Fueled Vehicles	195
■	1029.6, 1029.6.3, 1029.7 Open-air Assembly Seating	158	■	2311.6 Repair of Vehicles Fueled by CNG and LNG	198
■	1029.9.1 Minimum Aisle Width	161	■	2311.8 Repair of Vehicles Fueled by Lighter-than-air Fuels	200
■	1030.1 Emergency Escape and Rescue Openings	163			
■	1030.1.1 Operation of Emergency Escape and Rescue Openings	165			

■ 2403.2.1.3	Classified Electrical Areas Around Spray Booths	206	■ 5003.8.3.4	Construction of Control Areas	246
■ 2404.2, 2404.3.1, 914.9	Spray Rooms and Spray Booths	207	■ 5005.1.12	Protection of Hazardous Materials Piping Systems	248
■ 2810	Outdoor Storage of Pallets at Pallet Manufacturing and Recycling Facilities	210	■ 5103.2, 5104.1.2	Aerosol Products in Plastic Containers	250
■ Chapter 31	Umbrella Structures	213	■ 5103.2.2, 5104.2.2, 5104.3.3, 5104.8, 5106.2.2	Aerosol Cooking Spray Products	252
■ 3103.3.1	Tents and Membrane Structures Used as Special Amusement Buildings	214	■ 5306.1, 5306.2	Medical Gas Storage	254
■ 3103.6, 3103.9	Structural Stability of Tents	216	■ 5307.1, 5307.3	Liquid Carbon Dioxide Systems for Beverage Dispensing	257
■ 3105, 105.6.47, 105.7.22	Temporary Special Event Structures	218	■ 5307.4	Carbon Dioxide Enrichment Systems	260
■ 3106	Outdoor Assembly Events	221	■ 5703.6.2.2	Below-grade or Underground Piping Systems Connected to a Tank in an Underground Area	263
■ 3107.13	LP-gas Containers and Tanks Adjacent to Tents and Membrane Structures	225	■ 5707	Mobile Fueling Operations	265
■ Chapter 32	High-piled Combustible Storage	227	■ 5801.1	Scope	268
■ 3304.5, 3308, 3309.1	Fire Watch During Construction and Demolition	232	■ 6104.3	Location of LP-gas Containers	273
■ Chapter 38	Higher Education Laboratories	235			
■ Chapter 39	Processing and Extraction Facilities	236			
PART 5			PART 6		
Hazardous Materials			Referenced Standards & Appendices A through N		277
Chapters 50 through 67	239		■ NFPA 13	Section 23.2.1.1	278
■ Table 5003.1.1(1)	Consumer Fireworks	241	■ NFPA 72-2016	Section 23.8.1.2.1.1	279
■ 5003.1.1(1), 5003.11.1, 6303.1.1.2	Maximum Allowable Quantity for Class 3 Oxidizers	244	■ E102.1.7.1	Hazard Classification of Oxidizers	280
			■ Appendix N	Indoor Trade Shows and Exhibitions	282
			Index		285

Preface

The purpose of *Significant Changes to the California Fire Code, 2019 Edition*, is to familiarize fire officials, building officials, plans examiners, fire inspectors, design professionals and others with many of the important changes in the 2019 *California Fire Code* (CFC). This publication is designed to assist code users in identifying the specific code changes that have occurred and, more important, in understanding the reasons behind the changes. It is also a valuable resource for jurisdictions in order to help them explain the significance and impact of the changes as they go through their code adoption process.

Only a portion of the total number of code changes to the CFC are discussed in this book. The changes selected were identified for a number of reasons, including their frequency of application, special significance or change in application. However, the importance of the changes not included is not to be diminished. Further information on all code changes can be found in the Complete Revision History, available from the International Code Council® (ICC®), through the online store at <http://shop.iccsafe.org>. This resource collection provides the published documentation for each successful code change contained in the 2018 IFC since the 2015 edition.

Significant Changes to the California Fire Code, 2019 Edition, is arranged to follow the general layout of the CFC, including code sections and section number format. The table of contents, in addition to providing guidance in the use of this publication, allows for a quick identification of those significant code changes that occur in the 2019 CFC.

Throughout the book, each change is accompanied by a photograph or an illustration to assist in and enhance the reader's understanding of the specific change. A summary and a discussion of the significance of the change are also provided. Each code change is identified by type, be it an addition, modification, clarification or deletion.

The code change itself is presented in a legislative format similar to the style utilized for code change proposals. Deleted code language is shown with a strikethrough, and new code text is indicated by underlining. As a result, the actual 2019 code language is provided as well as

a comparison with the 2016 language, so the user can easily determine changes to the specific code text.

As with any code change text, *Significant Changes to the California Fire Code*, 2019 Edition, is best used as a companion to the 2019 CFC. Because only a limited discussion of each change is provided, the reader should reference the code itself in order to gain a more comprehensive understanding of the code change and its application.

The commentary and opinions set forth in this text are those of the authors and do not necessarily represent the official position of ICC. In addition, they may not represent the views of any enforcing agency because such agencies have the sole authority to render interpretations of the CFC. In many cases, the explanatory material is derived from the reasoning expressed by code change proponents.

Comments concerning this publication are encouraged and may be directed to ICC at significantchanges@iccsafe.org.

About the *International Fire Code*

Fire code officials, fire inspectors, building officials, design professionals, contractors and others involved in the field of fire safety recognize the need for a modern, up-to-date fire code. The *International Fire Code*® (IFC), 2018 Edition, is intended to meet these needs through model code regulations that safeguard the public health and safety in all communities, large and small. The IFC is kept up to date through ICC's open code development process. The provisions of the 2015 edition, along with those code changes approved through 2016, make up the 2018 edition.

One in a family of International Codes® published by ICC, the IFC is a model code that establishes minimum fire safety requirements for new and existing buildings, facilities, storage and processes. It addresses fire prevention, fire protection, life safety and safe storage and use of hazardous materials. The IFC provides a total approach of controlling hazards in all buildings and sites, regardless of the hazard being indoors or outdoors.

The IFC is a design document. For example, before a building is constructed, the site must be provided with an adequate water supply for fire-fighting operations and a means of building access for emergency responders in the event of a medical emergency, fire or natural or technological disaster. Depending on the building's occupancy and uses, the IFC regulates the various hazards that may be housed within the building, including refrigeration systems, application of flammable finishes, fueling of motor vehicles, high-piled combustible storage and the storage and use of hazardous materials. The IFC sets forth minimum requirements for these and other hazards and contains requirements for maintaining the life safety of building occupants, the protection of emergency responders, and to limit the damage to a building and its contents as the result of a fire, explosion or unauthorized hazardous material discharge and electrical systems. The IFC is available for adoption and use by jurisdictions internationally. Its use within a governmental jurisdiction is intended to be accomplished through adoption by reference, in accordance with proceedings establishing the jurisdiction's laws.

About the California Fire Code

Building officials, design professionals and others involved in the building construction industry recognize the need for a modern, up-to-date building code addressing the design, construction and installation of building systems through requirements emphasizing performance. The *International Fire Code* (IFC), 2018 Edition, is the basis for the 2019 *California Fire Code* (CFC) and is intended to meet these needs through model code regulations that safeguard the public health and safety in all communities, large and small.

The CFC is one in a family of California building codes (California Code of Regulations, Title 24) that are published on a triennial basis. This comprehensive fire code establishes minimum regulations for building systems by means of prescriptive and performance-related provisions. It is founded on broad-based principles that make possible the use of new materials and new building designs. The California Building Standards Commission (CBSC) is responsible for the administration of each code cycle, which includes the proposal, review and adoption processes. Supplements and erratas are issued throughout the cycle.

Acknowledgments

Significant Changes to the California Fire Code, 2019 Edition, is the result of a collaborative effort, and the author is grateful for the assistance and contributions by the California Fire Chiefs Association Fire Prevention Officers Section and the California Office of the State Fire Marshal and by the following talented staff of ICC Business and Product Development: Hamid Naderi, P.E., C.B.O., Senior Vice President; Doug Thornburg, A.I.A., C.B.O., Vice President, Director of Education and Certification; and Jay Woodward, A.I.A., Senior Staff Architect. The author would also like to thank Bob Davidson, Davidson Code Concepts, LLC; Howard Hopper, Regulatory Services Program Coordinator with Underwriters Laboratories LLC; and Pat McLaughlin, McLaughlin & Associates for their insight and assistance with application of some of the technical requirements.

A special thank you is extended to Robert Neale, Vice President, ICC Government Relations. Rob spent many hours working on the content, sharing his knowledge and providing peer review.

About the Authors

Kevin Reinertson
Deputy Fire Marshal
Riverside County Fire Department
Office of the County Fire Marshal

Kevin Reinertson has been actively involved in code development, fire prevention and code enforcement for 28 years. Kevin has served as the State Fire Marshal's representative on the California Building Standards Commissions

Code Coordinating Council and the California Building Officials/California Fire Chiefs Building Fire Advisory Committee. He was also a past chair of the Sacramento Valley Association of Building Officials Code Review and Development Committee. Kevin is currently on the Executive Board of the California Fire Chiefs Associations Fire Prevention Officers Southern Section ICC Chapter and serves as the co-chair of the Building and Fire Code Committee. In 2017, Kevin was appointed by the ICC Board of Directors to the ICC Fire Code Action Committee for a three-year term.

Kevin Reinertson joined the Riverside County Fire Department, California in 2015 as a Deputy Fire Marshal in charge of Special Projects, where he assists in the development, improvement, delivery and management of the Office of the County Fire Marshal.

Prior to coming to Riverside County, Kevin Reinertson worked at the California State Fire Marshal's Office (OSFM) where he was appointed Division Chief of Code Development and Analysis Division in 2011 and oversaw the adoption of the initial I-Codes in 2006 and subsequent years, up to the adoption of the 2016 California Fire and Building Codes. During his tenure at the OSFM, Kevin was involved with many committees and initiatives, including:

- Residential Fire Sprinklers and the California Codes Task Force
- Flammability Standards for Building Insulation Materials Committee
- Governor's Office Solar Photovoltaic Guidelines Committee
- Governor's Office Hydrogen Fuel Vehicle Stations Guidebook Task Group
- Task Group 400
- High-Rise Task Force
- Wildland Urban Interface Construction Standards Committee

Kevin's involvement in fire and building codes really stems from his work in designing and drafting building plans for his father's architectural firm. Before finding his way to the California Office of the Fire Marshal, Kevin was a District Representative II for the California Department of Housing and Community Development, which administers the building construction codes for residential occupancies for statewide application, as well as a Building Inspector and Plans Examiner for the City of Roseville and Sacramento County.

Through the years, Kevin Reinertson has been the recipient of several awards, including the Cal Chiefs NorCal Fire Prevention Officers Section "Charles H. Gray Memorial" award for promoting fire and life safety through code development processes throughout the community. Kevin was also the recipient of the CAL FIRE "Leadership" award for superior performance and demonstrating the ability to motivate others to positive action and to seek solutions to problems. Additionally, he was the recipient of the California Building Officials "Fire Official of the Year" award for significant achievement in protecting, promoting and ensuring the safety of the public and the Sacramento Valley Association of Building Officials Chuck Coen award for recognition of outstanding effort in code development.

Kevin H. Scott
 President
 KH Scott & Associates LLC

Kevin Scott is President of KH Scott & Associates LLC. Kevin has extensive experience in the development of fire safety, building safety and hazardous materials regulations. Kevin has actively worked for over 25 years in the development of fire code, building code and fire safety regulations at the local, state, national and international levels. Kevin previously worked as a Senior Regional Manager with the International Code Council, and before that, he was Deputy Chief for the Kern County Fire Department, California, where he worked for 30 years. He has developed and presented many seminars on a variety of technical subjects including means of egress, high-piled combustible storage, hazardous materials, and plan review and inspection practices.

Kevin was a member of the original IFC Drafting Committee that worked to create the first edition of the IFC. He served for seven years on the IFC Code Development Committee and was chairperson for the committee from 2001 to 2004. Kevin has actively participated in numerous technical committees to evaluate specific hazards and technologies, and to create regulations specific to those hazards.

Some of the more significant committees are:

- High-piled Combustible Storage Committee
- Hydrogen Gas Ad Hoc Committee
- Task Group 400
- Technical Advisory Committee on Retail Storage of Group ‘A’ Plastic Commodities
- Underwriters Laboratories Fire Council.

Kevin’s constant work to improve fire and life safety has been recognized on many levels. His contributions have been acknowledged by various organizations when they presented him with the following awards:

- Mary Eriksen-Rattan Award in 2013—presented by the Southern California State Fire Prevention Officers’ Association
- William Goss Award in 2009—presented by the California State Firefighters Association
- Fire Official of the Year Award in 2005—presented by the California Building Officials
- Robert W. Gain Award in 2003—presented by the International Fire Code Institute.

About the Contributor

Robert A. Neale
 Vice President
 Government Relations: National Fire Service Activities

Rob currently serves as the International Code Council Vice President for Government Relations: National Fire Service Activities. He is responsible for strategic guidance to help local fire organizations adopt and enforce the most recent version of the model codes and build relationships among code enforcement entities.

In 2015, Rob retired as Deputy Superintendent for the United States Fire Administration National Fire Academy in Emmitsburg, Maryland. He led the development of curriculum aimed at improving the professionalism of America's fire service.

In 2012, he received the FEMA Administrator's Award for Innovation in training for his development of the popular Coffee Break Training series. Rob was awarded the International Society for Performance Improvement award for the National Fire Academy class "Evaluating Performance-Based Designs" in 2004.

He has more than 30 years of experience in Washington state municipal fire protection as a fire chief, fire marshal and fire fighter.

Rob has a master's degree from the Center for Homeland Defense and Security at the Naval Postgraduate School and a bachelor's degree in Liberal Studies from Western Washington University.

Rob has been published regularly in national fire protection trade journals, and for many years has been content developer and platform instructor on codes, standards and fire protection systems.

About the International Code Council®

The International Code Council is a member-focused association. It is dedicated to developing model codes and standards used in the design, build and compliance process to construct safe, sustainable, affordable and resilient structures. Most US communities and many global markets choose the International Codes. ICC Evaluation Service® (ICC-ES®) is the industry leader in performing technical evaluations for code compliance fostering safe and sustainable design and construction.

Governmental Affairs Office:

500 New Jersey Avenue, NW, 6th Floor
Washington, DC 20001

Regional Offices:

Eastern Regional Office (BIR), Central Regional Office (CH),
Western Regional Office (LA)

888-ICC-SAFE (422-7233)
www.iccsafe.org