

DECK CONSTRUCTION

Based on the 2021 International Residential Code®

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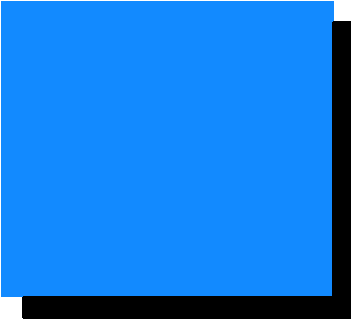
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Preface

Deck Construction Based on the 2021 International Residential Code® puts the provisions of the 2021 *International Residential Code®* (IRC®) that affect deck design and construction in the hands of the deck industry. The sections in this book are extracted from over 1,000 pages of the 2021 IRC, and retain the original section numbers and text. Commentary and graphics explain the application of each provision, thus providing code and education in one book. Deck contractors, installers, designers, homebuilders, inspectors, plan reviewers, and manufacturers will all find this book helpful in completing their work in accordance with the IRC provisions as well as enhancing their comprehension of how the IRC applies to deck design and construction. Sections of the 2018 IRC that were significantly altered in the 2021 edition were also provided in this book for those working under the previous edition. Code sections included are not necessarily in sequence because the code sections that are directly related to deck construction have been selected. For example, for Prescriptive and Engineered Design, Sections R301.1, R301.1.2, R301.1.3 and R507.1 have been included because they are related to the subject, but Section R301.1.1 has not been included. The same approach applies to exception numbers or other similar situations.

While novice deck builders will greatly benefit from this book, it is not written in the format of a “how-to” book and does not intend to teach novice deck builders about the fundamentals of deck construction. Rather, individuals with a basic understanding of deck construction can now take their skills to the next level, with a deck-specific comprehension of the leading residential code adopted in the United States. Unlike other deck books on the market, either with design ideas or how-to advice, the information contained in this book is organized in a manner that allows the reader to see and compare the author’s explanation and the IRC text simultaneously. The book can be used for training or simply read cover to cover or also can function as a jobsite reference of the IRC during plan approval, construction and inspections.

Though deck construction is popular in backyards across the country and construction and occupancy permits are approved daily, the code design and prescriptive provisions plus local government amendments are challenging for all involved in a deck project. Many new deck provisions have been added since the 2015 edition, but subjects such as lateral bracing, stairs, guards and any nonstandard load path through beams are not addressed prescriptively. This book is clear when presenting explanations to code provisions not prescriptively addressed in the code. It is the intent of this book to clearly present the code and establish an understanding of the baseline “minimum standards” such that above code designs or designs not covered by prescriptive code are more easily identifiable. This book is focused on the 2021 IRC but addresses the 2018 IRC as well, where the distinction is significant. For some subjects, the provisions from different editions will be presented and discussed independently. In other instances, small modifications will be presented together. Where modifications are clerical in nature or do not significantly affect the application in construction, only the 2021 code text is provided. The 2021 deck provisions are an improvement on the 2018 and are encouraged to be

used and approved as an alternative in accordance with Section R104.11, regardless of what code is adopted by the jurisdiction.

In an industry that has long been absent from model code development process, local government authorities have historically used their own discretion or documents for approving construction. The new deck provisions in the IRC in some cases may be contrary to these long-established local regulations and may take time to become commonplace nationwide. Minimum code provides for safe decks and maximum freedom and allows more people the opportunity for a deck under their feet. For those with a stronger budget, more discretionary design to suit one's preferences is always encouraged.

About the *International Residential Code*[®]

Building officials, design professionals, contractors and others involved in the field of residential building construction recognize the need for a modern, up-to-date residential code addressing the design and installation of building systems through both prescriptive and performance requirements. The 2021 *International Residential Code*[®] (IRC[®]) is intended to meet these needs through model code regulations that safeguard the public health and safety in all communities, large and small. The IRC is kept up to date through ICC's open code development process. The provisions of the 2018 edition, along with those code changes approved in the most recent code development cycle, make up the 2021 edition.

The IRC is one in a family of 15 International Codes[®] (I-Codes[®]) published by ICC. This comprehensive residential code establishes minimum regulations for residential 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 IRC is a comprehensive code containing provisions for building, energy conservation, mechanical, fuel gas, plumbing and electrical systems. The IRC 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 established by the jurisdiction's laws.

About the *International Code Council*[®]

The International Code Council is the leading global source of model codes and standards and building safety solutions that include product evaluation, accreditation, technology, codification, training and certification. The Code Council's codes, standards and solutions are used to ensure safe, affordable and sustainable communities and buildings worldwide. The International Code Council family of solutions includes the ICC Evaluation Service, the International Accreditation Service, General Code, S. K. Ghosh Associates, NTA Inc., ICC Community Development Solutions and the Alliance for National & Community Resilience. The Code Council is the largest international association of building safety professionals and is the trusted source of model codes and standards,

establishing the baseline for building safety globally and creating a level playing field for designers, builders and manufacturers.

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About NADRA®

The North American Deck and Railing Association, Inc. (NADRA) encourages best building practices to the industry and promotes deck safety to the consumer. NADRA is the voice of the industry, which is made up of deck builders, designers, engineers, inspectors, manufacturers, dealers/distributors, lumberyards, wholesalers and retailers, along with a wide spectrum of related service providers of the deck and railing industry.

NADRA's unwavering mission is to provide a qualified and unified source for the professional development, promotion, growth, and sustenance of the deck and railing industry so that members can continually exceed the expectations of their customers.

Outdoor living became popular over 40 years ago and continues to grow at an unprecedented and dynamic rate today. Estimates show that more than 69 percent of decks in use (approximately 30 million) are past their useful life and need to be replaced or repaired.

The Deck Safety Academy (DSA) provides for NADRA online classes, testing, an industry-supported Deck Safety Manual, and an online inspection program that delivers a qualified and efficient Deck Inspection Process.

At NADRA, we generate and connect great ideas with great people to inspire quality, knowledgeable leadership and achievement within the deck and railing industry. For more information, visit www.NADRA.org.

About the Author

Glenn Mathewson began his construction career in 1996 as a laborer and carpenter's apprentice. In 2005, he became a building, plumbing and mechanical inspector for the City of Westminster, Colorado, where for 13 years, he worked as an inspector and plan reviewer and earned his Master Code Professional Certification from ICC.

In 2012, he began exploring the use of technology to make codes more accessible and understandable, and opened www.BuildingCodeCollege.com, an ICC- and AIA-approved online school. Drawing on his experience as a tradesman, contractor, consultant and building inspector, he is able to review, discuss and teach the standards of construction with a true understanding of the realities involved with applying them in the field.

Glenn has authored over 100 technical articles in publications such as "Professional Deck Builder," "The Journal of Light Construction," "Fine Homebuilding" and "The Building Safety Journal," as well as ICC's *Deck Construction Based on the 2009 International Residential Code*. In 2011, he became Technical Advisor to the North American Deck and Railing Association (NADRA), where he assists the association with code-related initiatives and the development of the Master Deck Professional, Codes and Standards Certification. He represented the decking industry in the ICC code development process for the creation of many of the deck provisions in the 2015 and 2021 editions of the *International Residential Code*. He is a professional speaker and educator in residential codes, with audiences ranging from contractors to building officials at both public and private events.

Acknowledgments

Glenn Mathewson extends his foremost gratitude to Michael and Margie Beaudry and Heather Marchand for their tireless efforts to raise the professionalism of the deck and railing industry through their work for the North American Deck and Railing Association (NADRA). Being focused on the same mission, they have consistently supported and encouraged him professionally. However, they also have had an incredibly positive impact on his life through the great friendships they have formed.

Glenn also thanks the leading contributing members of the Deck Code Coalition with whom he has collaborated for years to develop new, quality, well-vetted, minimum standards of deck construction for the IRC. From this work, the codes available to the deck industry and provided in this book are so much more complete than what was available in the previous 2009 edition. Glenn knows he likely drove them crazy with his unwavering passion for the decking industry and his unabashed preaching of code philosophies. However, through their perseverance to put up with him, better codes were created. Though many others have contributed through the years, Billy Viars, Charles Bajnai, David Cooper, Erik Farrington, Gary Ehrlich, John Woestman, Loren Ross, and Mark Guthrie stuck it out with Glenn, most recently, through the uncomfortable arguments and disagreements necessary to create the new 2021 deck codes collectively, not individually. He offers his sincere thanks and respect to these professionals, for

without their efforts, there would be no deck code to update in this second edition book.

Glenn thanks the researchers who seek answers to the unique and unknown concepts of structural deck design. As you will learn in this book, decks do not fit any standard method of construction and there are many unanswered questions in our current industry practices. Across the country, this truth is overlooked by most, but not by Dr. Frank Woeste, Dr. Don Bender, and their professional colleagues. From ledger attachment, to guard post attachment, to lateral load evaluation, these researchers put their efforts toward finding scientific answers for something that many mistakenly think is simple, silly, and elementary—deck construction. In his goals to raise the decking industry, their research has been brave and incredibly valuable, and he hopes it will continue.

Finally, Glenn thanks all the members of NADRA for financially, passionately, and intellectually supporting their nonprofit industry association in the effort of deck code development. More specifically, Glenn thanks the deck builder members who have given so many hours of their time to lead the organization and recognizes the importance of that work. There are too many to name over the decade he has worked with NADRA but know that he remembers you and your contributions. It is the deck builders who drive his heart in the work he does in deck codes, and he is proud to have their trust.