SPECIAL INSPECTION MANUAL

2018 EDITION

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Foreword

From a Special Inspector's Perspective—

The special inspection manual is written to be a general overview of all the Special Inspection Categories listed in Chapter 17 of the *International Building Code*® (IBC®). From this reference guide, special inspectors, inspection firms and code officials can gain a wealth of basic knowledge concerning the requirements for special inspection in each listed category. For special inspectors, the manual will become the hands-on reference for project inspections as well as for certification testing.

The building codes, in a nutshell, are the written version of hard-won knowledge gained over years by numerous code officials and inspectors. The special inspection manual is similar in its construction. The individuals who gathered the knowledge on which this manual is based have had years of experience in dealing with special inspections whether in the implementation of a special inspection program or out on the building site with hands-on experience. It will be the task of future generations to add to this knowledge as new ideas, methods, categories and techniques become available.

As a master special inspector, I have spent the last 30+ years employed for engineering firms directly responsible for the special inspections listed in this manual. The inspections were performed on schools, shopping centers, high-rise structures, parking garages, bridges and heavy industrial plants. I have worked for the federal government, state and local jurisdictions, and public and private owners. The wealth of knowledge in the manual aids all who seek employment in the inspection field and those preparing to take certification exams. For jurisdictions, the manual is a great hands-on tool concerning the basic requirements for the individual items of Chapter 17 and the procedures and methodology used in inspecting these items. For the journeyman special inspector, the manual is an excellent reference volume for continued monitoring and updating of the current inspection program.

I would like to thank Mr. Steven D. Weidenhammer, P.E., for teaching me what it truly means to be an inspector, for teaching me the importance of giving back to the industry and for never giving up on me.

Finally, if I have but one request for all Journeyman and Master Special Inspectors, it is simply get involved. Join your local and regional ICC Chapters. Participate. Go to meetings and events. Join ICC Exam Development Committees. You are part of the ICC family as a whole.

Sincerely,
Kenneth C. Morong, MSI
ICC Board of International Professional Standards (BIPS)
Alfred Benesch & Company

From a Building Official's Perspective—

This manual is intended to assist building officials in designing and regulating their own special inspection programs and to tailor Chapter 17 to their needs. I employed many of the elements and key points presented in this manual when assisting jurisdictions with establishing their own quality assurance programs, ranging from one-person shops to departments of over 500 employees. I lectured across the country on special inspections and establishing special inspection initiatives, and I believe the use of this manual will be invaluable for anyone wishing to learn a practical approach to establishing an effective program.

As the Code Official for Clark County, Nevada, I was responsible for the code enforcement, plan review and inspection of pyramids, castles, volcanoes, sphinxes, pirate ships, dragons, reproductions of the Venice canals, Eiffel Tower and Empire State Building, and just about every other type of unconventional, unusual and eccentric structure dreamed up by designers to attract and entertain world travelers in Las Vegas, Nevada. The intricacies and complexity of these structures were staggering, requiring design and code enforcement expertise that were as unusual as the structures themselves and normally not part of a building department code enforcement arsenal. Even more challenging than the eccentricity of these structures was the sheer quantity of them. During peak years, at any one time, the Clark County building department was inspecting more than a dozen structures with valuations in excess of $2 billion combined, while meeting the needs of a population that doubled every 7 years, resulting in 750,000 inspections. Clark County could not have met the needs of our community, as well as the 43 million visitors we host each year, without a premier special inspection program designed and tailored to Clark County's specific needs. That program enabled me, the building official, to temporarily and inexpensively augment my staff and my staff's expertise during unusually heavy construction years and with unusual construction projects.

A well-developed special inspection program is one of the most valuable tools a code official can have in his arsenal to assist his jurisdiction. It expands the technical expertise of the organization; it provides expert input and support for code development and adoption; it represents an effective public/private partnership; and it provides for assistance to the jurisdiction during the sometimes erratic cycles in the construction industry.

"Special Inspections" were part of the Uniform Codes for many years, added to the National Building Code in the 1990s and included as a requirement under Chapter 17 since the inception of the *International Building Code* in 2000. Many jurisdictions adopt the model code without consideration of Chapter 17. When adopted, the administration of a special

inspection program becomes a mandate, requiring building officials to tailor their special inspection programs to their jurisdictions' needs.

Sandra Hyde, P.E., has covered the full gamut of topics ranging from duties and appropriate certifications to some of the technical details regarding such varied topics as steel, concrete, wood and exterior insulation and finish systems. This manual goes into details regarding participants' duties and responsibilities, and the need and requirements for structural observation. The appendices provide a wealth of information, including references on inspector certifications and sample special inspection forms.

Ms. Hyde has gathered insights from renowned contributors in both the public and private sectors, reflecting time-tested procedures as well as current best practices in the field of quality assurance.

I strongly recommend this manual be on every code official's desk, whether you develop a program or not. In your professional life there will come a time that an unusual structure, such as a 550-foot Ferris wheel or a volcano or even an ancient Egyptian sphinx, will appear under your purview, and having this tool available will be critical to your effective administration of the building code and to serving your community.

Sincerely,
Ron Lynn
Former Director/Building and Fire Official
Clark County Department of Building & Fire Prevention Bureau

Preface

In extreme natural events such as earthquakes and hurricanes, the most common contributing factor to significant structural damage and building failure is construction that fails to comply with codes, standards and design documents. Increasing inspection frequency, duration and detail and having specialized oversight during the construction process can help mitigate construction issues. The primary objective of Chapter 17 of the *International Building Code* is to improve construction quality in the field through special inspection, structural observation and testing.

The purpose of the Special Inspection Manual is to provide a comprehensive overview of the varied aspects of special inspection, with an emphasis on the role and responsibilities of special inspectors, building departments, design professionals, contractors and owners.

The publication is organized into 10 chapters and five appendices. The duties of the individuals and agencies involved in the special inspection process are described. A comparison of special inspector and building department inspections is included. The details of 17 specific types of special inspection required by the 2018 *International Building Code*® (IBC®) are covered. An extensive discussion addresses the development of special inspection programs by building departments. Also included are discussions regarding structural observations, proprietary products and accreditation of special inspection agencies. The appendices include detailed information on certification requirements for special inspectors; development of evaluation reports; and requirements for accreditation as a special inspection agency, third-party inspection agency, fabricator or testing laboratory. Online resources available as an extension of this manual include modifiable forms for special inspection activities.

The *Special Inspection Manual* incorporates content previously published in the International Code Council's *Model Program for Special Inspection*. Much of the Model Program's information is now located in Appendix C. Forms originating in the Model Program are located in Appendix B and available online at www.iccsafe.org/siforms.

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About the Author

Sandra Hyde, P.E., is a Senior Staff Engineer with the International Code Council (ICC) Product Development Group, where she develops technical resources in support of the structural engineering provisions of the International Codes. She reviews publications authored by ICC and engineering associations, and develops technical books and seminars based on the structural engineering and materials provisions of the *International Residential Code* (IRC) and *International Building Code* (IBC). Ms. Hyde has previous experience in manufacturing and research with Weyerhaeuser and is a Registered Civil Engineer in Idaho and California.

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.

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