

Fire Plan Review and Inspection Guidelines

2009 Edition

Mike Thrapp



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About this Textbook

This manual is in its 25th year of assisting fire protection designers, contractors, service technicians, and fire personnel with applying the requirements for codes and national standards.

The performance of any fire protection system carries a great expectation of reliability. The expectation is to minimize or eliminate the loss of life and/or property damage. This manual has been developed to assist the user in the design and installation of quality fire protection systems.

I appreciate the companies providing systems and services that assist in the protection of life and property. I commend those who maintain the high standards of the fire and life safety industry.

Sincerely,

Mike C. Thrapp

About the Author

Mike Thrapp's fire service career spans 27 years with 20 years serving at different capacities in fire prevention. He has served as Fire Marshal in Anchorage, Alaska, and Eugene, Oregon, for a total of 15 years.

While in Anchorage, he held an adjunct faculty member position for the Fire Science Program at the University of Alaska Anchorage. He obtained his ICBO Plans Examiner and Fire Code certifications in 1986 and currently possesses the Building Plans Examiner, and Fire Inspector and Plans Examiner certifications from the International Code Council. He is also certified as a Plans Examiner–A Level and a Plans Examiner–Fire and Life Safety in the State of Oregon. He received a Bachelor of Arts in Management, completed the National Fire Academy's Executive Fire Officer Program in 1994, and is currently pursuing a Bachelor's degree in Fire Engineering Technology from Eastern Kentucky University.

Disclaimer

Important!

This manual is designed as a resource, guideline, and policy document. The user is responsible to research and comply with all applicable codes and standards associated with the design, installation and maintenance of the systems mentioned in this manual.

The user of this document shall indemnify, defend, save, and hold the author harmless from any and all claims, lawsuits, or liability including attorneys' fees and costs allegedly arising out of, in connection with, or incident to any loss, damage or injury to persons or property occurring during the course of or as a result of the user's performance pursuant to using this manual.

Acknowledgments

Since 1985, this guide has evolved from a 28-page document to its present volume. Its origin began in Anchorage, Alaska, for local use and it migrated to Eugene, Oregon, where I was the City's Fire Marshal. Its use and publication has now been expanded by the International Code Council (ICC), beyond what I imagined.

Over the years, I am appreciative of those who have contributed ideas, constructive criticism, and recommendations in an effort to improve this document.

Many fire protection companies, office associates, peers, and designers have offered ideas and comments that have been incorporated into this book.

As the years passed, the book increased in content. Liz, who wishes to remain anonymous, who spent countless hours to proofread this document and as a result many more corrections had to be made. Her time commitment, tenacity, and attention to detail are evident and lauded.

Without the patience and encouragement of my wife, Linda, this document would not have been updated.

This edition of the book received contribution, detailed scrutiny, and review by ICC staff member Scott Stookey. His input, greatly respected and extolled, has taken the book to a new level. Former ICC staff member Page Dougherty did the initial review of the original content and recommended it be published by ICC. His efforts are also appreciated.

Each code change and subject additions that caused major revisions initiated a daunting task of editing, and without everyone's assistance this book would not exist.

Thank you!
Mike Thrapp

Preface

The basic requirements for plan review, inspection, and testing of the various fire protection systems are addressed in this manual. This document discusses major elements of the 2009 *International Fire Code*[®] (IFC[®]) and the 2009 *International Building Code* (IBC[®]) relevant to fire protection systems and their applicable standards.

Section 105.7 of the 2009 *International Fire Code*[®] (IFC[®]) establishes the minimum requirements for construction permits. The IFC requires construction permits for the installation or modification of private fire hydrants, automatic fire-extinguishing systems, fire alarm and detection systems, standpipe systems, fire pumps and related equipment. Construction permits are also required for operations involving the storage, use, handling and dispensing of hazardous materials, including flammable and combustible liquids, compressed gases and those materials regulated in Chapter 27 of the IFC.

Chapter 47 of the IFC adopts by reference over 100 standards written by the membership of the National Fire Protection Association (NFPA). NFPA publishes a variety of standards, but many of the standards adopted in IFC and IBC Chapter 9 address the design, installation, testing, and maintenance of water-based and alternative fire-extinguishing agents, including dry chemical, wet chemical, carbon dioxide, and clean agents. In addition, many of the adopted NFPA standards have extensive requirements for storage tanks used for the underground or above-ground storage of flammable and combustible liquids, spray finishing using flammable finishes and motor vehicle fuel-dispensing. In most cases, Section 105.7 of the IFC also requires construction permits for these various systems.

Fire Plan Review and Inspection Guidelines was developed to assist code officials responsible for the plan review and approval of shop drawings and calculations submitted for IFC construction permits. This text contains plan review and inspection guidelines for all of the fire protection systems required by Chapter 9 of the 2009 IFC. This text focuses on plan review of the various types of fire protection systems prescribed by the IFC and IBC.

The manuscript is organized to be as consistent as practical with the number convention used in the Chapter 9 of the IFC and IBC. Plan review worksheets are organized based on the type of fire protection system specified in the IFC and IBC. For automatic sprinkler systems, worksheets

are divided into specific subject matter, such as the requirements for NFPA 13R or 13D, and separate worksheets for the plan review of automatic sprinkler systems designed for the protection of storage occupancies are also included.

To assist code officials facilitate plan reviews, each plan review worksheet follows a format that is consistent with the requirements of the relevant IFC requirements or the applicable NFPA standard. Additionally, this text includes a compact disk of each of the plan review forms that can be electronically completed and printed. This provides a format that is consistent for each plan review which benefits the design professional, installing contractor, and code official. It also provides a means for jurisdictions to electronically store and retrieve plan review comments, which can save jurisdictions the burden of archiving paper files of plan review and construction inspection records generated during the installation or modification of these systems.

Users of the IFC and IBC understand that the International Code Council code development cycle is on a different time schedule when compared to the NFPA process. However, design professionals and installing contractors generally wish to use the latest edition of a particular NFPA standard because the new requirements can benefit them with a more cost-effective installation that provides improved safety for the building owner. For automatic sprinkler systems, fire detection and alarm systems and fire pumps, this text contains plan review worksheets for the 2007 editions of NFPA 13, 13R, 13D, 20 and 72 as well as worksheets for the 2010 editions of these NFPA standards.

To promote consistency in construction inspections, each system plan review worksheet also has a construction inspection checklist to assist inspectors ensure that the fire protection system or hazardous material process is installed and tested in accordance with the 2009 IFC and the applicable NFPA standard.

The content of the plan review worksheets and the construction inspection checklists are not all inclusive. It is the user's responsibility to research and apply the pertinent codes and standards applicable for plans and calculations to confirm compliance.

The following fire protection systems are addressed in this text:

Automatic Sprinkler Systems including

NFPA 13

NFPA 13 sprinkler requirements for the protection of high-piled storage

NFPA 13R

NFPA 13D

Alternative Automatic Fire-Extinguishing Systems including

Clean agent systems

Carbon dioxide systems

Water mist systems

Thermal Fire Protection and Life Safety Systems including

Kitchen hood suppression systems

Emergency and standby power systems

Fire detection and alarm systems

Fire pumps

Private fire service mains

Private water tank systems

Standpipe systems

For each type of system, the following forms are provided to facilitate the plan review and construction inspections:

Plan submittal requirements; including a plan review worksheet

New installation acceptance inspection and testing instructions, and a worksheet

Installer certification form

References for the pertinent codes and/or standards

Miscellaneous information and sample jurisdiction policies

Pre- and post-installation requirements

About the International Code Council®

The International Code Council (ICC®), a membership association dedicated to building safety, fire prevention, and energy efficiency, develops the codes and standards used to construct residential and commercial buildings, including homes and schools. The mission of ICC is to provide the highest quality codes, standards, products, and services for all concerned with the safety and performance of the built environment. Most United States cities, counties and states choose the International Codes, building safety codes developed by the International Code Council. The International Codes also serve as the basis for construction of federal properties around the world, and as a reference for many nations outside the United States. The Code Council is also dedicated to innovation and sustainability and Code Council subsidiary, ICC Evaluation Service, issues Evaluation Reports for innovative products and reports of Sustainable Attributes Verification and Evaluation (SAVE).

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