

NFPA®

241

**Standard for
Safeguarding Construction,
Alteration, and
Demolition Operations**

2019



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NFPA® 241

Standard for

Safeguarding Construction, Alteration, and Demolition Operations

2019 Edition

This edition of NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*, was prepared by the Technical Committee on Construction and Demolition and acted on by NFPA at its June Association Technical Meeting held June 11-14, 2018, in Las Vegas, NV. It was issued by the Standards Council on August 14, 2018, with an effective date of September 3, 2018, and supersedes all previous editions.

This edition of NFPA 241 was approved as an American National Standard on September 3, 2018.

Origin and Development of NFPA 241

Work on the subject of construction, alteration, and demolition operations began in 1930, when the NFPA Committee on Construction Operations developed the document, *Recommended Good Practice Requirements for Building Construction Operations*. This text was adopted by the NFPA, with revisions, in 1933. In 1942, a tentative revision was submitted, and, while no official action was taken, the revision was published subsequently for information purposes in Volume III of the *National Fire Codes®* published by the NFPA.

The NFPA Committee on Building Construction had jurisdiction over this standard when a tentative text prepared by that committee was adopted at the 1957 NFPA Annual Meeting. That text was unanimously approved by the NFPA in 1958. Complete revisions were adopted by the NFPA in 1968 and 1973. An editorial revision was approved in 1975 that brought the standard into conformance with the NFPA *Manual of Style*. The standard was substantively reconfirmed in 1980.

When the document was reconfirmed in 1980, it came under the Technical Committee on Building Construction. The 1986 edition represented a complete rewrite, the result of a comprehensive review by the committee. The 1986 update changed the format in which the safeguards were presented. Chapters 1 through 5 were general in nature and applied to both construction and demolition processes. Chapter 6 presented the specifics associated only with construction processes. Chapter 7 addressed the specifics of demolition. A new Chapter 8 included mandatory references with which various provisions of the standard were required to comply. Nearly 20 codes and standards were referenced in a mandatory fashion.

The 1986 edition also expanded the treatment of items related to an overall construction and demolition fire safety plan. Definitions were expanded and added to cover terms with meanings that were unique to the standard. Temporary heating equipment was required to be listed. The section on smoking was expanded. Trash disposal was broadened to include housekeeping. Outside chutes, fire cutoffs, and explosives used in demolition were addressed. Material on temporary standpipes was included in this edition.

The 1989 edition included a complete rewrite of the section on roofing operations and greatly expanded the associated appendix items to address torch-applied roofing in additional detail. A new chapter on underground operations was added.

Revisions to the 1993, 1996, and the 2000 editions mainly consisted of reformatting and clarifications.

The 2004 edition changes mainly consisted of the elimination of exceptions and the reversal of units of measurement for compliance with the *Manual of Style for NFPA Technical Committee Documents*.

Revisions for the 2009 edition included a requirement for a 2-hour fire watch following torch-applied roofing operations and new provisions for exterior trash chutes.

Changes in the 2013 edition included additional requirements for temporary heating equipment, an expansion of items needed in a construction or demolition fire safety program, and an updating of references related to underground air quality.

The 2019 edition includes not only a number of clarifications but an introduction of new requirements. A special provision is added to the application section that allows the authority having jurisdiction to implement portions of the standard as appropriate. Recognizing that temporary heating equipment and cooking equipment continue near the top of the list for ignition sources in the construction environment, new provisions are added to reinforce the need to secure such equipment to prevent it from being displaced. A new requirement is added to ensure that electrical service disconnecting means are readily accessible and clearly labeled as such. A reference to NFPA 56 is added with regard to cleaning and purging of fuel gas piping during both the installation and removal process of such systems. A requirement for guard services is now specifically mandated for a building using combustible construction that is more than 40 ft above grade. A new section is added to Chapter 11 that deals with standpipe installation in tunnels under construction to coordinate with the requirements of NFPA 502. Finally, a new chapter dealing with tall timber structures is included in this edition. This is in anticipation of codes in the United States and other countries that will expand the use of heavy timber construction beyond the traditional height limits of six stories.

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Committee Scope: This Committee shall have primary responsibility for documents on the identification and control of fire hazards associated with the construction, alteration, and demolition of buildings, tunnels, and bridges not otherwise covered by other NFPA standards.

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Standard for

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2019 Edition

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A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex B. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex B.

Chapter 1 Administration

1.1* Scope. This standard shall apply to structures in the course of construction, alteration, or demolition, including those in underground locations.

1.2 Purpose. This standard is intended to prescribe minimum safeguards for construction, alteration, and demolition operations in order to provide reasonable safety to life and property from fire during such operations.

1.3 Application.

1.3.1* This standard provides measures for preventing or minimizing fire damage during construction, alteration, and demolition operations.

1.3.2* The public fire department and other fire protection authorities also shall be consulted for guidance.

1.3.3 Alteration activities shall be permitted to require the use of both the demolition and construction activity requirements, as applicable.

1.3.4 A fire safety program shall be included in all construction, alteration, or demolition contracts, and the right of the owner to administer and enforce this program shall be established, even if the building is entirely under the jurisdiction of the contractor.

N 1.3.5* The authority having jurisdiction (AHJ) shall be permitted to accept partial requirements of this standard.

1.4 Equivalency. Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.5 Units and Formulas.

1.5.1 SI Units. Metric units of measurement in this standard are in accordance with the modernized metric system known as the International System of Units (SI).

1.5.2 Primary Values. The SI value for a measurement and the inch-pound value given in parentheses shall each be acceptable for use as primary units for satisfying the requirements of this standard.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 10, *Standard for Portable Fire Extinguishers*, 2017 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2016 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2016 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2017 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2018 edition.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment*, 2016 edition.

NFPA 51, *Standard for the Design and Installation of Oxygen-Fuel Gas Systems for Welding, Cutting, and Allied Processes*, 2018 edition.

NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, 2014 edition.

NFPA 54, *National Fuel Gas Code*, 2018 edition.

NFPA 56, *Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems*, 2017 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2017 edition.

NFPA 70®, *National Electrical Code®*, 2017 edition.

NFPA 70E®, *Standard for Electrical Safety in the Workplace®*, 2018 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2016 edition.

NFPA 101®, *Life Safety Code*®, 2018 edition.

NFPA 130, *Standard for Fixed Guideway Transit and Passenger Rail Systems*, 2017 edition.

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances*, 2016 edition.

NFPA 495, *Explosive Materials Code*, 2018 edition.

NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, 2015 edition.

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, 2017 edition.

NFPA 1963, *Standard for Fire Hose Connections*, 2014 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2018 edition.

2.3 Other Publications.

- N 2.3.1 SFPE Publications.** Society of Fire Protection Engineers, 9711 Washingtonian Blvd, Suite 380, Gaithersburg, MD 20878.

SFPE Handbook of Fire Protection Engineering, 5th edition, 2016.

- N 2.3.2 Other Publications.**

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, 2014 edition.

NFPA 287, *Standard Test Methods for Measurement of Flammability of Materials in Cleanrooms Using a Fire Propagation Apparatus (FPA)*, 2017 edition.

NFPA 600, *Standard on Facility Fire Brigades*, 2015 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2018 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.4 Shall. Indicates a mandatory requirement.

3.2.5 Should. Indicates a recommendation or that which is advised but not required.

- N 3.2.6 Standard.** An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

- N 3.3.1 Critical Heat Flux (CHF).** The minimum heat flux at or below which there is no ignition. [287, 2017]

- N 3.3.2 Cross Laminated Timber (CLT).** A prefabricated engineered wood product consisting of not less than three layers of solid-sawn or structural composite lumber where the adjacent layers are cross-laminated and bonded with structural adhesives to form a solid wood element. [5000, 2018]

- N 3.3.3 Facility Fire Brigade.** An organized group of employees at a facility who are knowledgeable, trained, and skilled in at least basic fire-fighting operations, and whose full-time occupation might or might not be the provision of fire suppression and related activities for their employer. [600, 2015]

3.3.4* Hot Work. Work involving burning, welding, or a similar operation that is capable of initiating fires or explosions. [51B, 2014]

3.3.5* Qualified Agency. Any individual, firm, corporation, or company that, either in person or through a representative, is regularly engaged in such work, is trained and familiar with all precautions required, and has complied with all the requirements of the authority having jurisdiction.

3.3.6 Roofing Kettle. Any container in excess of a 56.8 L (15 gal) capacity used for preheating tar, asphalt, pitch, or similar substances for waterproofing.

3.3.7 Roofing System.

3.3.7.1 Single-Ply Roofing System. A single-layer roof covering made of plastic, synthetic rubber, or modified bitumen.

3.3.7.2 Torch-Applied Roofing System. A bituminous roofing system using membranes that are adhered by heating with a torch and melting an asphalt backcoating instead of mopping hot asphalt for adhesion.

3.3.8* Structure. That which is built or constructed and limited to buildings and nonbuilding structures.

3.3.8.1 Protected Structure. A structure equipped with operational automatic sprinkler systems or Class I, II, or III wet standpipe or dry standpipe systems for fire department use.

3.3.8.2 Underground Structure. A structure located in an underground tunnel, a shaft, a chamber, or a passageway; or cut and covered excavation.

3.3.9 Thermal Spraying. A group of welding or allied processes in which finely divided metallic or nonmetallic materials are deposited in a molten or semimolten condition to form a coating. The coating material can be in the form of a powder, a ceramic rod, a wire, or molten materials.

3.3.10 Thermit Welding. A welding process that produces coalescence of metals by heating them with superheated liquid metal resulting from a chemical reaction between a metal oxide and aluminum, with or without the application of pressure. Filler metal, where used, is obtained from the liquid metal.

Chapter 4 Temporary Construction, Equipment, and Storage

4.1 Application. For the purposes of Chapter 4, the term *temporary* shall be defined as the duration of the construction project.

4.2 Temporary Offices and Sheds.

4.2.1* Separation distances between buildings under construction and construction-related structures, such as temporary offices, trailers, sheds, and other facilities for the storage of tools and materials having combustible construction or contents, shall be in accordance with Table 4.2.1.

4.2.2* Detachment between temporary structures, adequate temporary fixed fire protection systems, and portable equipment shall be provided as required by the authority having jurisdiction.

4.2.3 Only approved heating devices installed in accordance with the manufacturer's specifications shall be used in temporary offices and sheds.

4.2.4 Clearance shall be provided around stoves, heaters, and all chimney and vent connectors to prevent ignition of adjacent combustible materials in accordance with NFPA 31 (liquid fuel

devices); NFPA 54 (fuel gas devices); and NFPA 211 (connectors and solid fuel). (Where temporary heating devices are used, see Section 5.2.)

4.3 Temporary Enclosures.

4.3.1 Only noncombustible panels, flame-resistant tarpaulins, or approved materials of equivalent fire-retardant characteristics shall be used.

4.3.2 Any other fabrics or plastic films used shall be certified as conforming to the requirements of Test Method 2 contained in NFPA 701.

4.3.3 Where used to enclose structures, forming equipment, and similar items, the enclosing material shall be fastened securely or guarded by construction so it cannot be blown by the wind against heaters or other sources of ignition.

4.3.4 Fire Extinguishers.

4.3.4.1 Temporary enclosures shall be equipped with a minimum of one fire extinguisher suitable for all classes of fires that are expected inside the enclosure.

4.3.4.2 Fire extinguishers shall be located so that travel distance to a fire extinguisher does not exceed 15 m (50 ft).

4.4 Equipment.

4.4.1* Internal combustion engines and associated equipment, such as air compressors, hoists, derricks, pumps, and similar devices, shall be located so that the exhausts discharge well away from combustible materials.

4.4.2 Where the exhausts are piped outside the structure under construction, alteration, or demolition, a clearance of at least 230 mm (9 in.) shall be maintained between such piping and combustible material.

4.4.3 Internal combustion engines and associated equipment shall be shut down and allowed to cool sufficiently prior to refueling.

4.4.4 Service areas for equipment shall not be located within structures under construction, alteration, or demolition.

4.4.5 Fuel for internal combustion engines shall not be stored within structures under construction, alteration, or demolition, unless otherwise permitted in Section 5.5.

Table 4.2.1 Separation Distances

Temporary Structure Exposing Wall Length		Minimum Separation Distance	
m	ft	m	ft
6	20	9	30
9	30	11	35
12	40	12	40
15	50	14	45
18	60	15	50
>18	>60	18	60

Notes:

(1) Where the separation distance between temporary structures is less than the minimum separation distance, then the exposing wall length is considered to be the sum of the individual exposing wall lengths of the temporary structures.

(2) A 75 percent reduction in separation distances shall be permitted to be applied, provided automatic sprinkler protection is used in the exposing structure.

(3) The separation distances apply to single-level structures only. This table does not apply to multilevel, unsprinklered structures. A level, where applying this table, is 3.6 m (12 ft).

Chapter 5 Processes and Hazards

5.1 Hot Work.

5.1.1* Responsibility for hot work operations and fire prevention precautions, including permits and fire watches, shall be in accordance with NFPA 51B except as modified in Chapter 9.

5.1.2 Gas-operated cutting and welding equipment using multiple oxygen and fuel gas cylinders shall be in accordance with NFPA 51.

5.1.3 Fire Watch.

5.1.3.1 Fire watches shall be assigned no other duties.

5.1.3.2 A fire watch shall be posted for the duration of the work and for 2 hours thereafter for torch-applied roofing operations (see 9.3.9).