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NFPA 170 Standard for Fire Safety Symbols 1994 Edition

National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101

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Policy Adopted by NFPA Board of Directors on December 3, 1982

The Board of Directors reaffirms that the National Fire Protection Association recognizes that the toxicity of the products of combustion is an important factor in the loss of life from fire. NFPA has dealt with that subject in its technical committee documents for many years.

There is a concern that the growing use of synthetic materials may produce more or additional toxic products of combustion in a fire environment. The Board has, therefore, asked all NFPA technical committees to review the documents for which they are responsible to be sure that the documents respond to this current concern. To assist the committees in meeting this request, the Board has appointed an advisory committee to provide specific guidance to the technical committees on questions relating to assessing the hazards of the products of combustion.

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NFPA 170

Standard for

Fire Safety Symbols

1994 Edition

This edition of NFPA 170, *Standard for Fire Safety Symbols*, was prepared by the Technical Committee on Fire Safety Symbols and acted on by the National Fire Protection Association, Inc. at its Fall Meeting held November 15-18, 1993 in Phoenix, AZ. It was issued by the Standards Council on January 14, 1994, with an effective date of February 11, 1994, and supersedes all previous editions.

The 1994 edition of this document has been approved by the American National Standards Institute.

Changes other than editorial are indicated by a vertical rule in the margin of the pages on which they appear. These lines are included as an aid to the user in identifying technical changes from the previous 1991 edition.

Origin and Development of NFPA 170

This 1994 (and second) edition of NFPA 170 represents the completion of an effort to combine four previously separate documents that covered fire safety symbols for different purposes. These documents were:

NFPA 171, *Public Firesafety Symbols*
NFPA 172, *Fire Protection Symbols for Architectural and Engineering Drawings*
NFPA 174, *Fire Protection Symbols for Risk Analysis Diagrams*
NFPA 178, *Symbols for Fire Fighting Operations.*

The Technical Committee on Fire Safety Symbols believes that placing all fire safety symbols in one document will make it easier for users of symbols to find the one(s) most appropriate for their application. It will also eliminate duplication between these and eventually other NFPA documents.

The first edition of NFPA 170 placed these four documents in one document, but did not combine them, except for definitions that were in each document. For this second edition of NFPA 170, the Technical Committee on Fire Safety Symbols has completely restructured the text into a logical and cohesive arrangement. It also eliminated the duplication of symbols that had occurred because several of the previous separate documents had included symbols from one or more of the other documents for completeness.

Technical changes of significance for this edition include the following:
- the addition of a symbol for campfires and their prohibition in a particular area.
- new symbols for use by the fire service (one for sprinkler connections; the other on the location of child care centers).
- the addition of symbols for smoke barriers, wall fire-rating, backflow preventers, types of telephone stations, new types of smoke detectors, illuminated exit signs, and belowground tanks.
- the revision of symbols for fire/smoke damper, foam extinguisher, and aboveground tank or water tower.

For a description of how each of the previous four separate documents developed between 1977 and 1986 addressed a particular subject, see the Origin and Development section of the 1991 edition of NFPA 170.

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This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred.

NOTE: Membership on a Committee shall not in and of itself constitute an endorsement of the Association or any document developed by the Committee on which the member serves.

Committee Scope: The Committee shall have primary responsibility for documents on fire safety symbols including those for building design plans, investigation diagrams, maps, and for public fire safety. It shall coordinate its work with NFPA technical committees and other groups dealing with subjects to which fire safety symbols apply.

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates explanatory material on that paragraph in Appendix A.

Information on referenced publications can be found in Chapter 6 and Appendix B.

Chapter 1 General

1-1 Scope. The scope of this standard is symbols used for fire safety and associated hazards.

1-2 Purpose. The purpose of this standard is to standardize the symbols used in representing fire and associated hazards.

1-3 Units. Metric units of measurement used in this standard are in accordance with the International System of Units (SI). One unit (liter), outside of but recognized by SI, is commonly used in international fire protection. For conversion factors, see Appendix C-5.4.

Chapter 2 Definitions

2-1 Official NFPA Definitions.

Approved. Acceptable to the authority having jurisdiction.

NOTE: The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization concerned with product evaluations that is in a position to determine compliance with appropriate standards for the current production of listed items.

Authority Having Jurisdiction. The organization, office, or individual responsible for approving equipment, an installation, or a procedure.

NOTE: The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed. Equipment or materials included in a list published by an organization acceptable to the authority having jurisdiction and concerned with product evaluation that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

NOTE: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

Shall. Indicates a mandatory requirement.

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

2-2 Definitions of Terms Used in the Standard.

Referent.* An object or concept (message) represented by a symbol.

Supplementary Indicators.* Figures, numbers, subscripts, or letter abbreviations used to enhance the effectiveness of symbols.

Symbol.* A graphic representation of a referent.

Chapter 3 Symbols for General Use

3-1 Introduction.

3-1.1 Scope. This chapter provides general referents and symbols for fire prevention and visual alerting for fire and related life safety emergencies.

3-1.2 Purpose.

3-1.2.1 The purpose of this chapter is to provide uniform fire safety symbols to improve communication wherever signs and symbols are employed to provide fire safety information.

3-1.2.2 This chapter provides uniformity in the selection of symbols designed to assist in locating exits, fire safety alerting equipment, and safe areas.

3-1.2.3* The fundamental imagery for symbols, as well as their background color and shape, is designated in this chapter.

3-1.2.4* This chapter does not specify viewing distance, size, or optimal combinations of symbols, words, or other presentations.

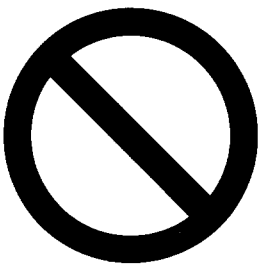
3-1.3* Symbol Presentation.

3-1.3.1 Orientation for prohibition symbols shall not be altered from that shown in this chapter.

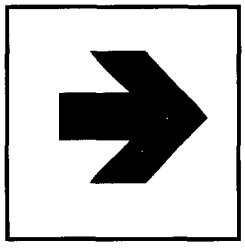
3-1.3.2 The symbol background shape shall be square.

Exception: For prohibition symbols a circle and diagonal slash (at 45° from upper left to lower right) shall be used.

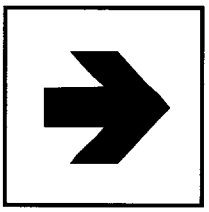
Example:



3-1.3.3 Symbol Color. The symbol color shall meet the requirements of ANSI Z535.1, *Safety Color Code.*

	Referent	Symbol	Characteristics	Application†
3-2 Symbols for General Use.				
3-2.1	Emergency Exit		Square Field; Background Green; Door Opening White; Image in Green or Black.	The identification and location of an emergency exit. Example: The location of exit for use in a fire emergency.
3-2.2	Emergency Exit		Square Field; Background Green; Door Opening White; Image in Green or Black.	The identification and location of a route to be used in an emergency. Example: The direction to a fire exit.
			For Arrows; Square Field; Background White; Arrow in Green or Black.	
3-2.3	Accessible Emergency Exit		Square Field; Background Green; Door Opening White; Image in Green or Black.	The identification of an emergency exit that is accessible to disabled users, as specified by ANSI A117.1. Example: The location of a fire exit that is accessible to disabled users.
			International Symbol of Accessibility per ANSI A117.1.	

† Use is not restricted to the examples cited.

	Referent	Symbol	Characteristics	Application†
3-2.4	Accessible Emergency Exit Route		Square Field; Background Green; Door Opening White; Image in Green or Black.	The identification of a route that leads to an emergency exit that is accessible to disabled users. Example: The location of the route toward a fire exit that is accessible to disabled users.
			International Symbol of Accessibility per ANSI A117.1.	
			For Arrows; Square Field; Background White; Arrow in Green or Black.	
3-2.5	Not an Exit		Square Field; Background Green; Door Opening White; Image in Green or Black; Red Circle and Diagonal Slash.	The identification of doors that do NOT lead to an exit. Example: The location of an interior door such as one leading to a closet, interior court yard, or basement.
3-2.6	Use Stairs in Case of Fire		Square Field; Red Flame; Black Figure; White Background.	An instruction to the user to use stairs (downward egress) in case of fire. Example: The identification that stairs are to be used in case of fire.
3-2.7	Use Stairs in Case of Fire		Square Field; Red Flame; Black Figure; White Background.	An instruction to the user to use stairs (upward egress) in case of fire. Example: The identification that stairs are to be used in case of fire.

†Use is not restricted to the examples cited.

	Referent	Symbol	Characteristics	Application†
3-2.8	Do Not Use Elevator in Case of Fire.		Square Field; Red Flame; Black Figures; White Background; Red Circle and Slash.	An instruction to not use elevators in case of fire. Example: Posted near elevator call button.
3-2.9	No Smoking		Circular Field; Red Circle and Slash; Black Image; White Background.	The identification of areas in which smoking is prohibited. Example: Identification of areas, such as those for flammable liquid storage, where smoking could lead to fire or explosion.
3-2.10	No Campfires		Circular Field; Red Circle and Slash; Black Image; White Background.	Identification of areas, such as municipal parks, where campfires are not permitted.

†Use is not restricted to the examples cited.

Chapter 4 Symbols for Use by the Fire Service

4-1 Introduction.

4-1.1 Scope. This chapter presents standard referents and symbols for visually alerting fire fighters and other emergency responders during fire and related emergencies.

4-1.2 Purpose.

4-1.2.1 The purpose of this chapter is to provide uniform fire fighting symbols to improve communication whenever symbology is employed to provide information to fire fighters and other emergency responders.

4-1.2.2 This chapter provides uniformity in the selection of symbols intended to assist fire fighters in locating utilities and fire fighting equipment.

4-1.2.3* Fundamental shapes of symbols as well as background color and shape are designated in this chapter.

4-1.3* Symbol Presentation.

4-1.3.1* Symbol Shapes. Basic fundamental symbol shapes are the primary emphasis of this chapter.

4-1.3.2 Symbol Background.

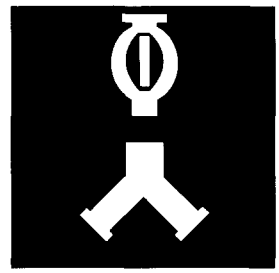
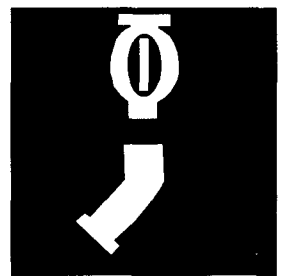
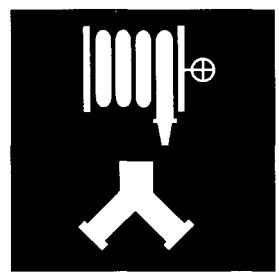
4-1.3.2.1 The background shall be square.

4-1.3.2.2 The background color shall be red, white, or blue as designated and shall meet the requirements of American National Standards Institute Standard Z535.1, *Safety Color Code*, for safety red, white, or blue.

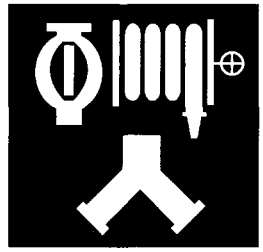
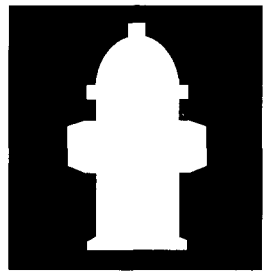
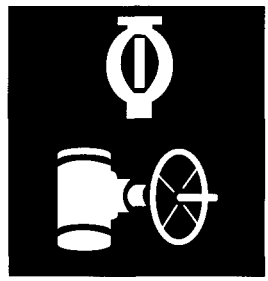
4-1.3.3 Symbol Color.

4-1.3.3.1 The symbol color shall be safety white or blue and shall meet the requirements of ANSI Z535.1, *Safety Color Code*, for safety white or blue.

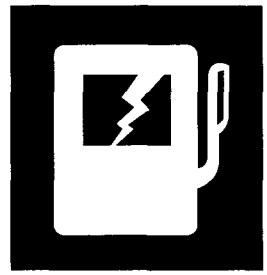
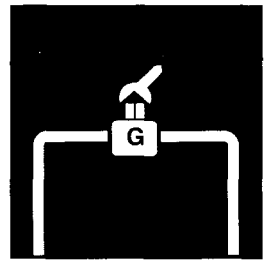
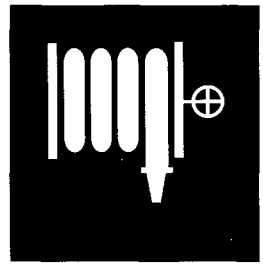
4-1.3.4 Symbol Orientation. Symbol orientation shall not be altered from that shown in this chapter.

	Referent	Symbol	Characteristics	Application†
4-2 Symbols for Use by the Fire Service.				
4-2.1	Fire Department Automatic Sprinkler Connection — Siamese		Square Field; Red Background; White Symbol.	The identification and location of a fire department automatic sprinkler connection. Examples: • The location of siamese automatic sprinkler connections on buildings. • The location of siamese free-standing automatic sprinkler connections.
4-2.2	Fire Department Automatic Sprinkler Connection – Single 1 1/2" or 2 1/2"		Square Field; Red Background; White Symbol.	The identification and location of a fire department automatic sprinkler connection. Examples: • The location of a single automatic sprinkler connection on buildings. • The location of a single free-standing automatic sprinkler connection.
4-2.3	Fire Department Standpipe Connection		Square Field; Red Background; White Symbol.	The identification and location of a fire department standpipe connection. Examples: • The location of standpipe connections on buildings and structures. • The location of free-standing connections.

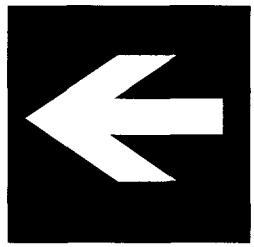
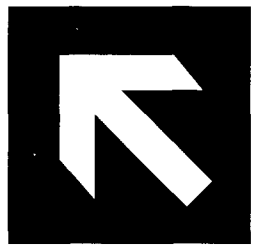
†Use is not restricted to the examples cited.

	Referent	Symbol	Characteristics	Application†
4-2.4	Fire Department Combined Automatic Sprinkler/Standpipe Connection		Square Field; Red Background; White Symbol.	The identification and location of a fire department combined automatic sprinkler/standpipe connection. Examples: •The location of combined sprinkler/ standpipe connections on buildings. • The location of free-standing combined sprinkler/ standpipe connection locations.
4-2.5	Fire Hydrant		Square Field; Red Background; White Symbol.	The identification and location of a fire hydrant. Examples: • The location of a fire hydrant or similar water supply. • NOTE: The symbol may be of particular use where vehicles or snowfall frequently obscure hydrant locations.
4-2.6	Automatic Sprinkler Control Valve		Square Field; Red Background; White Symbol.	The identification and location of automatic sprinkler control valves. Examples: • The location of control valves for automatic sprinkler systems. • On doors of rooms containing control valves.

†Use is not restricted to the examples cited.

	Referent	Symbol	Characteristics	Application†
4-2.7	Electric Panel or Electric Shutoff		Square Field; Blue Background; White Symbol.	The identification and location of an electrical panel or other electric shutoff device. Example: • The location of electric panels or other electric control devices that may be located in basements or mechanical rooms.
4-2.8	Gas Shutoff Valve		Square Field; Red Background; White Symbol; Red Letter G.	The location of a gas shutoff valve. Examples: • The location of gas shutoff valve(s). • On doors of rooms containing gas shutoff valves.
4-2.9	Fire Fighting Hose or Standpipe Outlet		Square Field; Red Background; White Symbol.	The location of a fire fighting hose or a standpipe outlet. Examples: • The location of interior fire fighting hose stations and standpipe outlets in buildings and structures. • The location on bridges or elevated highways.
4-2.10	Fire Extinguisher		Square Field; Red Background; White Symbol.	The location of a fire extinguisher. Example: • The location of a fire extinguisher in buildings and exterior locations.

†Use is not restricted to the examples cited.

	Referent	Symbol	Characteristics	Application†
4-2.11	Directional Arrow		Square Field; Background (Red or Blue) to correspond to accompanying sign; White Symbol.	Direction to the location of fire fighting equipment or utility. Must always be used in conjunction with, and adjacent to, another symbol indicating the particular equipment or utility.
4-2.12	Diagonal Directional Arrow		Square Field; Background (Red or Blue) to correspond to accompanying sign; White Symbol.	Direction to the location of fire fighting equipment utility. Must always be used in conjunction with, and adjacent to, another symbol indicating the particular equipment or utility.
4-2.13	Child Care Center		Square Field; Blue Infant and Hands; White Background.	The identification and location of child care centers. Examples: • On the door opening into child care center. • At a fire department command or access point indicating presence and location of child care center.

†Use is not restricted to the examples cited.

Chapter 5 Symbols for Use in Drawings and Diagrams

NOTE: This chapter on architectural/engineering symbols draws heavily on the symbols already developed by various societies, agencies, and industry.

5-1 Introduction.

5-1.1 Scope. This chapter presents symbols for use in drawings and diagrams.

5-1.2* Purpose. The purpose of this chapter is to provide uniformity in the use of fire safety and related symbols in the preparation of drawings and diagrams.

5-1.3 Application.* The symbols in this chapter are intended for, but not limited to, architectural and engineering drawings, fire detection and suppression drawings, and fire risk and/or loss analysis diagrams.

NOTE: Devices infrequently used in a given set of drawings and diagrams are not standardized by this document. They usually are accompanied by narrative description, either on the drawing or in specifications.

5-1.4* Symbol Presentation.

5-1.4.1 Symbol Shapes. Basic fundamental shapes are the primary emphasis of this chapter. Drawing scale, line thickness, etc., are the subject of standards on drawing practice.

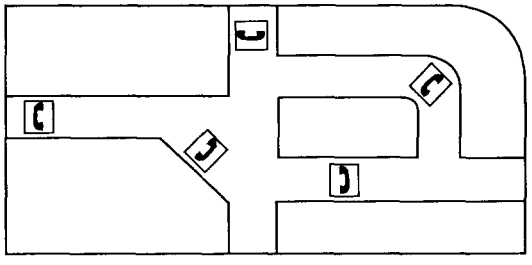
5-1.4.2 Screened Lines. Screened lines in the chapter are not to be considered part of the symbol, but are used to represent the piping, wiring, or mounting surface associated with the symbol.

5-1.4.3 Symbol Scale. Scale of the symbol is important in that symbols shall all be used in the same relative size on any one drawing.

5-1.4.4 Symbol Orientation.

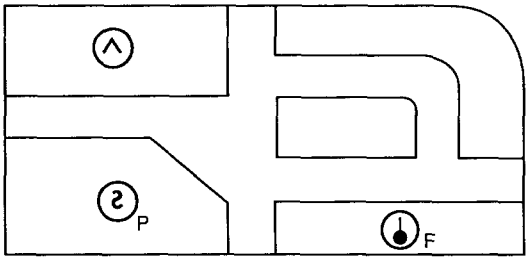
5-1.4.4.1 Orientation of some symbols shall always be changed. These symbols must always be oriented to the walls, piping, electrical lines, etc., to which they are attached. (See Example 1.)

Example 1:



5-1.4.4.2 Orientation of some symbols shall not be changed. These symbols shall be indicated with a dagger (†) in the standard. (See Example 2.)

Example 2:



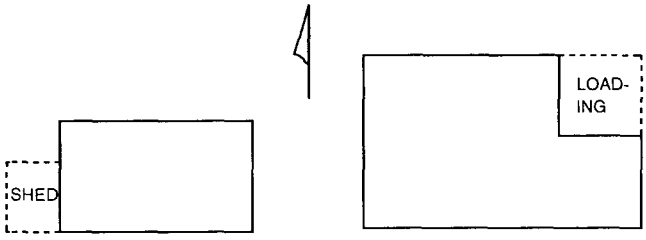
5-2 Symbols for Site Features.

5-2.1 Buildings.

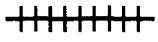
5-2.1.1 The exterior walls of buildings shall be outlined in single thickness lines if other than fire-rated and double thickness lines if fire-rated.

5-2.1.2 The perimeter of canopies, loading docks, and other open-walled structures shall be shown by broken lines.

Examples:

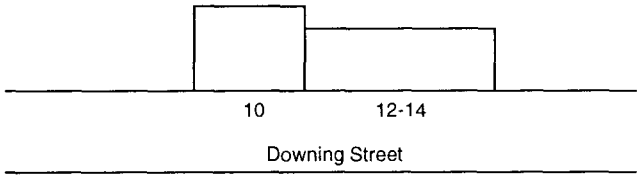


5-2.2 Railroad Tracks. Railroad tracks shall be shown by a single line with cross dashes.



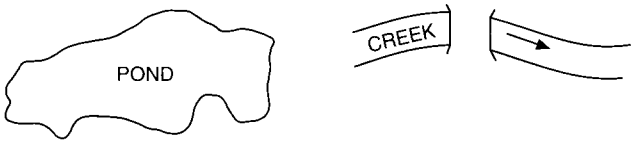
5-2.3 Streets. Streets shall be shown, usually at property lines.

Example:



5-2.4 Bodies of Water. Rivers, lakes, etc., shall be outlined.

Examples:

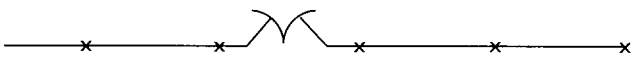


5-2.5 Fences.

5-2.5.1 Fences shall be shown by lines with "x's" every in. (25 mm).

5-2.5.2 Gates shall be shown.

Example of fence with gate:



5-2.6 Property Lines. The notation given below shall indicate property lines.

5-2.7 Fire Department Access. The symbol for fire department access shall be:

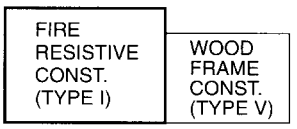
5-2.8 Other Site Features. For other fire protection site features, see Section 5-4.

5-3 Symbols for Building Construction.

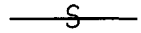
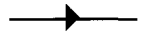
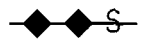
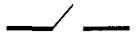
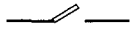
5-3.1 Types of Building Construction. Types of construction shall be shown narratively.

NOTE: See NFPA 220, *Standard on Types of Building Construction.*

Example:



5-3.2* Height. Height shall be shown to indicate number of stories above ground, number of stories below ground, and height from grade to eaves. (See Figure A-5-3.2.)

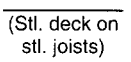
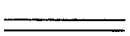
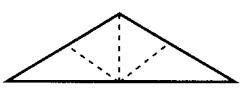
	Referent (Synonym)	Symbol	Comments
5-3.3	**Walls and Parapets.**		
5-3.3.1*	Wall		(a)  Smoke barrier (b)  1/2 hr fire-rated (c)  1/2 hr fire-rated/ smoke barrier (d)  3/4 hr fire-rated (e)  3/4 hr fire-rated/ smoke barrier (f)  1 hr fire-rated (g)  1 hr fire-rated/ smoke barrier (h)  2 hr fire-rated (i)  2 hr fire-rated/ smoke barrier (j)  3 hr fire-rated (k)  3 hr fire-rated/ smoke barrier (l)  4 hr fire-rated (m)  4 hr fire-rated/ smoke barrier
5-3.3.2*	Parapet		One cross for each 6 in. (150 mm) parapet extends above roof. (Shown is plan view of symbol.) (See also example in Appendix A-5-3.3.2.)
5-3.4	**Floor Openings, Wall Openings, Roof Openings, and Their Protection.**		
5-3.4.1	Opening in Wall		
5-3.4.2	Rated Fire Door in Wall (Less than 3 hours)		
5-3.4.3	Fire Door in Wall (3-hour rated)		
5-3.4.4	Elevator in Combustible Shaft		

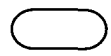
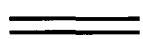
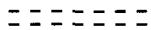
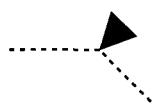
	Referent (Synonym)	Symbol	Comments
5-3.4.5	Elevator in Non-combustible Shaft		
5-3.4.6	Open Hoistway		
5-3.4.7	Escalator		
5-3.4.8	Stairs in Combustible Shaft		
5-3.4.9	Stairs in Fire-rated Shaft		
5-3.4.10	Stairs in Open Shaft		
5-3.4.11	Skylight		

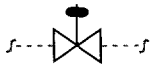
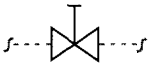
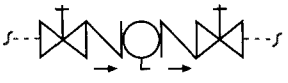
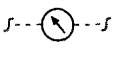
5-3.5* Special Symbols for Cross-Sections. *(See Figure A-5-3.5.)*

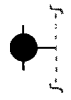
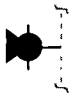
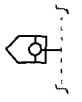
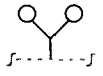
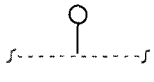
5-3.5.1 The following symbols shall indicate features of cross-sections. It is recognized that descriptive notes often are required.

5-3.5.2 Roof, Floor Assemblies.

5-3.5.2.1	Fire-Resistive Floor or Roof		
5-3.5.2.2	Wood Joisted Floor or Roof		
5-3.5.2.3	Other Floors or Roofs		Note construction.
5-3.5.2.4	Floor/Ceiling or Roof/ Ceiling Assembly		Details indicated, as necessary.
5-3.5.2.5	Floor on Ground		
5-3.5.2.6	Truss Roof		Note construction.

	Referent (Synonym)	Symbol	Comments
	5-3.6 Miscellaneous Features. A number of features related to fire protection that do not fall under Sections 5-3.1 through 5-3.5 are given below.		
5-3.6.1	Boiler		
5-3.6.2	Chimney		Describe height and construction.
5-3.6.3	Fire Escape		
5-3.6.4	Tank Aboveground		
5-3.6.4.1	Horizontal		Indicate type, dimensions, construction, capacity, pressurization, and content.
5-3.6.4.2	Vertical		Indicate type, dimensions, construction capacity, pressurization, and content.
5-3.6.5	Tank, Belowground		Indicate type, dimensions, construction, capacity, pressurization, and content.
	5-4 Water Supply and Distribution Symbols.		
5-4.1	Mains, Pipe		
5-4.1.1	Public Water Main		Indicate pipe size and material.
5-4.1.2	Private Water Main		Indicate pipe size and material.
5-4.1.3	Water Main Under Building		Indicate pipe size and material.
5-4.1.4	Suction Main		Indicate pipe size and material.
5-4.1.5	Thrust Block		

	Referent (Synonym)	Symbol	Comments
5-4.1.6	Riser		
5-4.2	Valves (general)		Basic shape. Indicate valve size.
5-4.2.1	Valve in Pit		Indicate valve size.
5-4.2.2	Post Indicator Valve		Indicate valve size.
5-4.2.3	Key-Operated Valve		Indicate valve size.
5-4.2.4	OS & Y Valve (Outside Screw and Yoke, Rising Stem)		Indicate valve size.
5-4.2.5	Indicating Butterfly Valve		Indicate valve size.
5-4.2.6	Nonindicating Valve (Nonrising-Stem Valve)		Indicate valve size.
5-4.2.7	Check Valve		Basic shape. Indicate valve size, direction of flow.
5-4.2.8	Backflow Preventer—Double Check Type		Also referred to as a "double check valve assembly."
5-4.2.9	Backflow Preventer — Reduced Pressure Zone (RPZ) Type		
5-4.3	Meter		Indicate type.

	Referent (Synonym)	Symbol	Comments
5-4.4	Hydrants		
5-4.4.1	Private Hydrant, One Hose Outlet		Indicate size**, type of thread, or connection.
5-4.4.2	Public Hydrant, Two Hose Outlets		Indicate size**, type of thread, or connection.
5-4.4.3	Public Hydrant, Two Hose Outlets and Pumper Connection		Indicate size**, type of thread, or connection.
5-4.4.4	Wall Hydrant, Two Hose Outlets		Indicate size**, type of thread, or connection.
5-4.4.5	Private Housed Hydrant, Two Hose Outlets		Indicate size**, type of thread, or connection
5-4.5	Fire Department Connections		
5-4.5.1	Siamese Fire Department Connection		Specify type, size, and angle.
5-4.5.2	Free-Standing Siamese Fire Department Connection		Sidewalk or pit type, specify size.
5-4.5.3	Single Fire Department Connection		Specify type, size, thread, and angle.

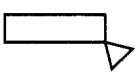
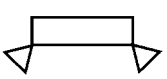
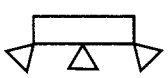
**Symbol element may be utilized in any combination to fit the type of hydrant.

	Referent (Synonym)	Symbol	Comments
5-4.6	Fire Pumps		
5-4.6.1	Fire Pump With Drives		
5-4.6.2	Fire Pump		Free standing. Specify number and sizes of outlets.
5-4.6.3	Test Header		Wall

5-5 Symbols for Control Panels.

5-5.1	Control Panel		Basic shape. (a) FCP Fire Alarm Control Panel (b) FSA Fire System Annunciator (c) FTR Fire Alarm Transponder or Transmitter (d) ESR Elevator Status/Recall (e) FAC Fire Alarm Communicator (f) HCP Halon Control Panel (g) HVA Control panel for heating, ventilation, air conditioning, exhaust stairwell pressurization, or similar equipment

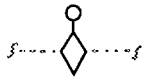
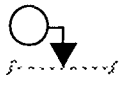
5-6 Symbols Related to Means of Egress.

5-6.1	Emergency Light, Battery Powered, One Lamp		Indicate if light head (lamp) is remote from battery.
5-6.2	Emergency Light, Battery Powered, Two Lamps		Indicate if light head (lamp) is remote from battery.
5-6.3	Emergency Light, Battery Powered, Three Lamps		Indicate if light head (lamp) is remote from battery.

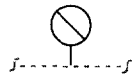
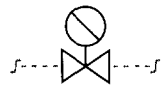
	Referent (Synonym)	Symbol	Comments
5-6.4	Illuminated Exit Sign, Single Face		Indicate direction of flow for the face.
5-6.5	Illuminated Exit Sign, Double Face		Indicate direction of flow for each face.

5-7 Symbols for Fire Alarms, Detection, and Related Equipment.

5-7.1	Signal Initiating Devices and Switches		
5-7.1.1	Manual Stations		Basic shape.
			(a)  Halon
			(b)  Carbon Dioxide
			(c)  Dry Chemical
			(d)  Foam
			(e)  Wet Chemical
			(f)  Pull Station
5-7.1.1.1	Telephone Station (Telephone Call Point)		(a)  Accessible
			(b)  Jack
			(c)  Hand-set
5-7.1.1.2	Abort Switch		
5-7.1.2	Automatic Detection and Supervisory Devices		Basic shape.

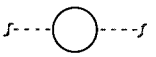
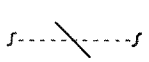
	Referent (Synonym)	Symbol	Comments
5-7.1.2.1†	Heat Detector (Thermal Detector)		(a)  Combination — Rate of Rise and Fixed Temperature
			(b)  Rate Compensation
			(c)  Fixed Temperature
			(d)  Rate of Rise Only
5-7.1.2.2†	Smoke Detector		(a)  Photoelectric Products of Combustion Detector
			(b)  Ionization Products of Combustion Detector
			(c)  Beam Transmitter
			(d)  Beam Receiver
5-7.1.2.3	Smoke Detector in Duct		
5-7.1.2.4	Gas Detector		
5-7.1.2.5†	Flame Detector (Flicker Detector)		Indicate ultraviolet, infrared, or visible radiation-type detectors.
5-7.1.2.6	Flow Detector/Switch		
5-7.1.2.7†	Pressure Detector/ Switch		Specify type — water, low air, high air, etc.
5-7.1.2.8†	Level Detector/ Switch		

†Symbol orientation must not be changed.

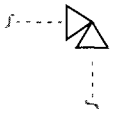
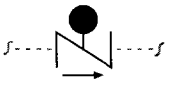
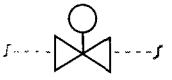
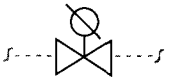
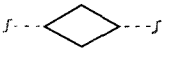
	Referent (Synonym)	Symbol	Comments
5-7.1.2.9	Tamper Detector		Alternate term — Tamper Switch.
5-7.1.2.10	Valve with Tamper Detector/Switch		
5-7.2	Indicating Appliances		
5-7.2.1	Speaker/Horn (Electric Horn)		(a)  Mini-Horn
5-7.2.2	Bell (Gong)		
5-7.2.3	Water Motor Alarm (Water Motor Gong)		Shield optional.
5-7.2.4	Horn with Light	(a) 	Horn with light as separate assembly.
		(b) 	Horn with light as one assembly.
5-7.2.5	Light (Lamp, Signal Light, Indicator Lamp, Strobe)		
5-7.3	Related Equipment		
5-7.3.1	Door Holder		

Referent (Synonym)		Symbol	Comments
5-8 Symbols for Fire Extinguishing Systems.			
5-8.1 Symbols for Various Types of Extinguishing Systems.			
NOTE: These symbols are intended for use in identifying the type of system installed to protect an area within a building.			
5-8.1.1	Water-based Systems		
5-8.1.1.1	Wet Charged System		
	(a)		Automatically Actuated
	(b)		Manually Actuated
5-8.1.1.2	Dry System		
	(a)		Automatically Actuated
	(b)		Manually Actuated
5-8.1.1.3	Foam System		
	(a)		Automatically Actuated
	(b)		Manually Actuated
5-8.1.2	Dry Chemical Systems		
5-8.1.2.1	For Liquid, Gas, and Electrical Type Fires		
	(a)		Automatically Actuated
	(b)		Manually Actuated

	Referent (Synonym)	Symbol	Comments
5-8.1.2.2	For Fires of All Types (Except Metals)		
	(a)		Automatically Actuated
	(b)		Manually Actuated
5-8.1.3	Systems Utilizing a Gaseous Medium		
5-8.1.3.1	Carbon Dioxide System		
	(a)		Automatically Actuated
	(b)		Manually Actuated
5-8.1.3.2	Halon System		
	(a)		Automatically Actuated
	(b)		Manually Actuated
5-8.1.4	Supplementary Symbols		
5-8.1.4.1	Fully Sprinklered Space		
5-8.1.4.2	Partially Sprinklered Space		
5-8.1.4.3	Nonsprinklered Space		

	Referent (Synonym)	Symbol	Comments
5-8.2 Symbols for Fire Sprinkler Heads.			
5-8.2.1	Upright Sprinkler		Note 1
5-8.2.2	Pendent Sprinkler		Notes 1, 2
5-8.2.3	Upright Sprinkler, Nippled Up		Note 1
5-8.2.4	Pendent Sprinkler, on Drop Nipple		Notes 1, 2
5-8.2.5	Sprinkler, With Guard		Upright sprinkler head shown. Note 1
5-8.2.6	Sidewall Sprinkler		Note 1
5-8.2.7	Outside Sprinkler		Specify type, orifice size. For example: Open sprinkler (window or cornice).
5-8.3 Symbols for Piping, Valves, Control Devices, and Hangers.			
	NOTE: See also Section 5-4 for related symbols.		
5-8.3.1	Sprinkler Piping and Branch Line		Indicate pipe size.
5-8.3.2	Pipe Hanger		This symbol is a diagonal stroke imposed on the pipe that it supports.

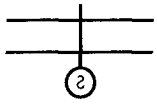
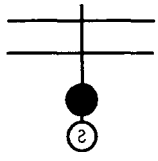
NOTE 1: Temperature rating of sprinkler and other characteristics may be shown via legends where a limited number of an individual type of sprinkler is called for by the design.
NOTE 2: Can notate "DP" on drawing and/or in specifications where dry pendent sprinklers are employed.

	Referent (Synonym)	Symbol	Comments
5-8.3.3	Angle Valve (Angle Hose Valve)		Indicate size, type, and other required data.
5-8.3.4	Check Valve (General)	(See symbol in 5-4.2.7.)	
5-8.3.5	Alarm Check Valve		Specify size, direction of flow.
5-8.3.6	Dry Pipe Valve		Specify size.
5-8.3.7	Dry Pipe Valve With Quick Opening Device (Accelerator or Exhauster)		Specify size and type.
5-8.3.8	Deluge Valve		Specify size and type.
5-8.3.9	Preaction Valve		Specify size and type.

5-9 Symbols for Portable Fire Extinguishers.

5-9.1	Portable Fire Extinguisher		Basic shape.
5-9.2	Water Extinguisher		
5-9.3	Foam Extinguisher		
5-9.4	Dry Chemical Extinguishers		
5-9.4.1	For Fires of Liquid, Gas, Electrical Types		(BC-Type)

	Referent (Synonym)	Symbol	Comments
5-9.4.2	For Fires of All Types, Except Metals		(ABC-Type)
5-9.5	CO_2 Extinguishers		
5-9.6	Halon Extinguishers		
5-10 Symbols for Fire Fighting Equipment.			
5-10.1	Fire Fighting Equipment		Basic shape. Generally for use with other symbols to represent specific devices.
5-10.2	CO_2 Reel Station		
5-10.3	Dry Chemical Reel Station		
5-10.4	Foam Reel Station		
5-10.5	Hose Station, Dry Standpipe		
5-10.6	Hose Station, Charged Standpipe		
5-10.7	Monitor Nozzle, Dry		Specify orifice size.
5-10.8	Monitor Nozzle, Charged		Specify orifice size.

	Referent (Synonym)	Symbol	Comments
	5-11 Symbols for Smoke/Pressurization Control.		
5-11.1	Purge Controls		
5-11.1.1	Manual Control		
5-11.2	Fans		Arrow indicates direction of flow.
5-11.2.1	General		
5-11.2.2	Duct		
5-11.2.3	Roof		
5-11.2.4	Wall		
5-11.3	Dampers		
5-11.3.1	Fire		
5-11.3.2	Smoke		
5-11.3.3	Fire/Smoke		
5-11.3.4	Barometric		
5-11.4	Pressurized Stairwell		Orient as required for base or head injection.
5-11.5	Ventilation Openings		Orient as required for intake or exhaust.

	Referent (Synonym)	Symbol	Comments
5-12 Miscellaneous Symbols.			
5-12.1	Agent Storage Container		Specify type of agent and mounting.
5-12.2	Special Spray Nozzle		Specify type, orifice, size, other required data (shown here on pipe).

Chapter 6 Referenced Publications

6-1 The following documents or portions thereof are referenced within this standard and shall be considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

6-1.1 ANSI Publications. American National Standards Institute, 1430 Broadway, New York, NY 10018.

ANSI A117.1-1980, *Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.*

ANSI Z535.1-1991, *Safety Color Code.*

Appendix A Explanatory Material

This Appendix is not a part of the requirements of this NFPA document, but is included for informational purposes only.

A-2-2 Referent. A referent may be abstract such as a condition concept, function, relationship, fact, or action.

A-2-2 Supplementary Indicators. Effectiveness of symbols can be supplemented by figures, numbers, subscripts, or letter abbreviations. These supplementary indicators may be placed inside of or adjacent to the symbol as seen fit. A legend of these indicators, with their meaning, should accompany each set of documents on which they are used.

A-2-2 Symbol. Ideally, a symbol should be graphically simple, should be readily understood, should have a strong impact, and should be easily remembered.

A-3-1.2.3 Changes in line thickness, scale, or details are not recommended. In practice, symbols may be combined with other symbols or devices such as words and lighted panels to provide optimal visual alerting.

A-3-1.2.4 The reader is referred to other standards, such as those prepared by the NFPA Committee on Safety to Life and the ANSI Z535 Committee on Safety Signs and Colors, for such information.

A-3-1.3 Reflective materials may be used.

A-4-1.2.3 In practice, symbols may be combined with other devices, such as words and lighted panels, to provide optimal alerting. This chapter does not specify viewing distance, size, or optimal combinations of symbols, words, and other presentations.

A-4-1.3 Reflective materials may be used.

A-4-1.3.1 Changes in line thickness, scale, or details are not recommended.

A-5-1.2 The symbols in this chapter are intended to be simple, transferable by use of templates, and limited to those referents that are used repetitively in a set of drawings.

A-5-1.3 The effectiveness of the symbols in this chapter may be enhanced by the use of supplementary figures, subscripts, numbers, or letter abbreviations.

A-5-1.4 Diagram Preparation and Contents. Where appropriate, diagrams include, but are not limited to, the following:

(a) Title block indicating:

1. Name of company or organization
2. Person making drawing and date of drawing
3. Name and location of facility involved.

(b) "North" direction arrow properly oriented to the position of buildings shown.

(c) Scale of diagram, if used, or "not to scale." Scale may be given with a bar measurement if reduction copies are to be made.

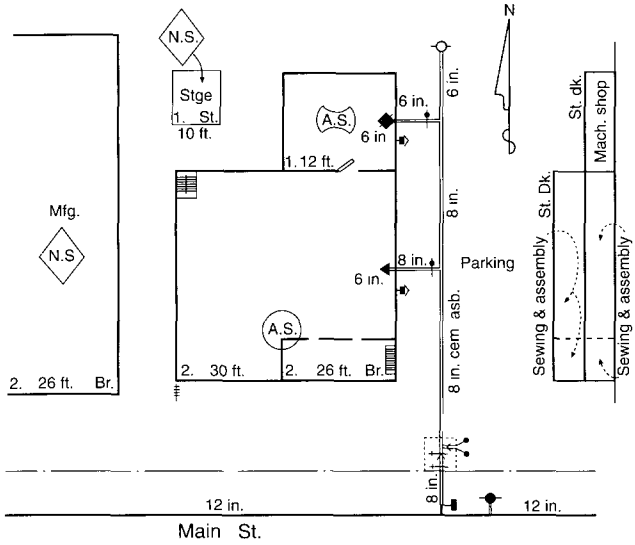


Figure A-5-1.4 Diagram to exemplify the use of symbols for risk analysis drawing.

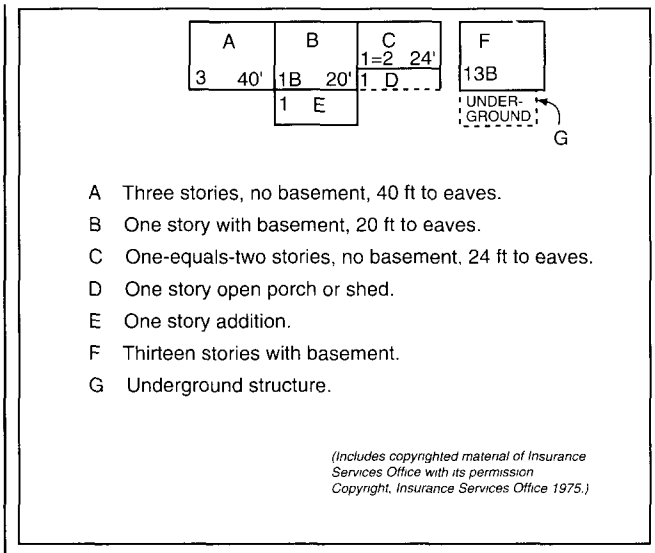
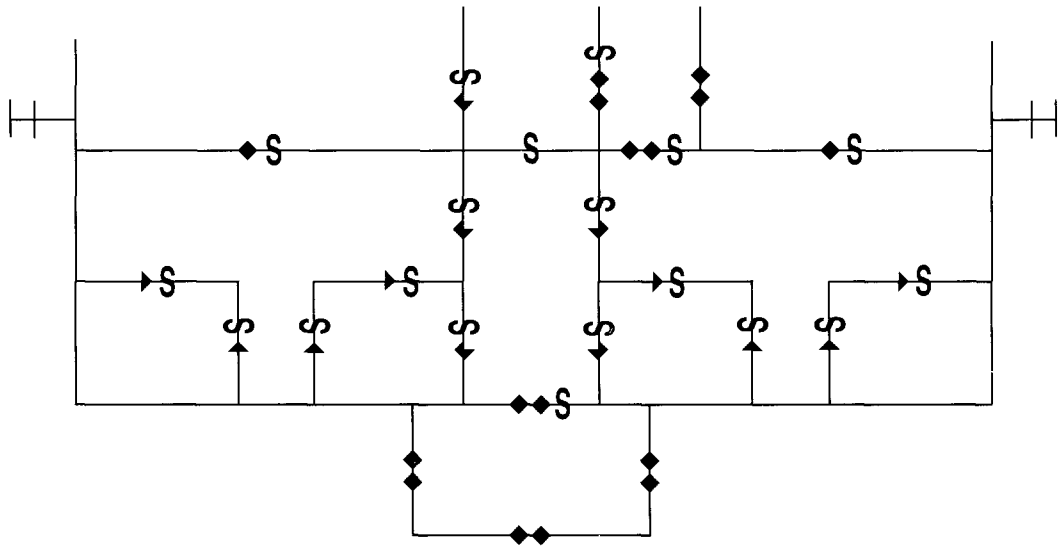


Figure A-5-3.2 Building height symbols example.



Figures A-5-3.3.1(a) and A-5-3.3.2 Symbol used to note wall ratings and parapets on life safety plans and risk analysis plans/cross-sections.

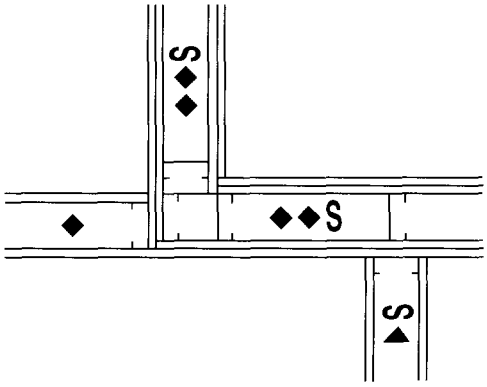


Figure A-5-3.3.1(b) Symbol used to note wall ratings on design and construction documents.

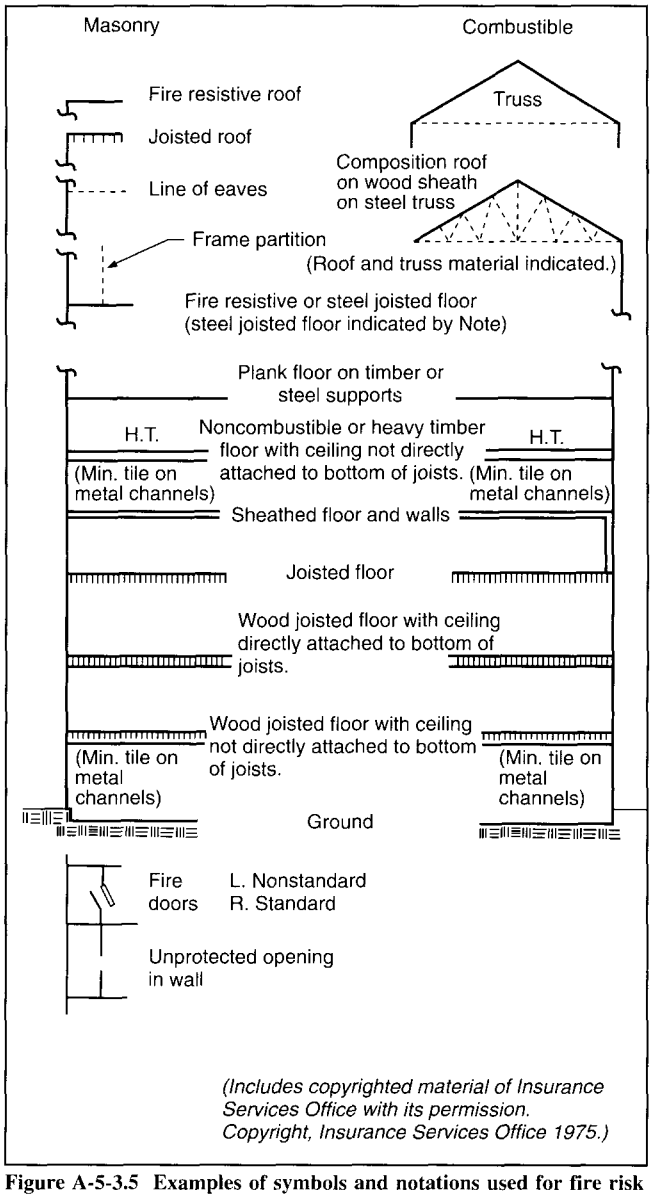


Figure A-5-3.5 Examples of symbols and notations used for fire risk analysis cross-section.

Appendix B Referenced Publications

B-1 The following documents or portions thereof are referenced within this standard for informational purposes only and thus are not considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

B-1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA *101®, Life Safety Code®*, 1994 edition.

NFPA 220, *Standard on Types of Building Construction*, 1992 edition.

NFPA 704, *Standard System for the Identification of the Fire Hazards of Materials*, 1990 edition.

B-1.2 Other Publications.

B-1.2.1 Not used.

B-1.2.2 Not used.

B-1.2.3 (for Chapter 3)

B-1.2.3.1 ANSI Publications. American National Standards Institute, 1430 Broadway, New York, NY 10018.

ANSI Z35.1-1972, *Specifications for Accident Prevention Signs.*

ANSI Z35.4-1973, *Specifications for Informational Signs Complementary to ANSI Z35.1-1972, Accident Prevention Signs.*

B-1.2.3.2 Other Publications.

Collins, B. L., *The Development and Evaluation of Effective Symbol Signs.* National Bureau of Standards, Building Science Series, BSS 141, May 1982.

Collins, B. L., *Use of Hazard Pictorials/Symbols in the Minerals Industry.* National Bureau of Standards, NBSIR 83-2732, March 1983.

Collins, B. L. and Lerner, N. D., *An Evaluation of Exit Symbol Visibility.* National Bureau of Standards, NBSIR 83-2675, March 1983.

Collins, B. L. and Lerner, N. D., "Assessment of Fire Safety Symbols," *Human Factors*, 1982, Vol. 24, pp. 75-84.

Collins, B. L., Lerner, N. D., and Pierman, B. C., *Symbols for Industrial Safety.* National Bureau of Standards, NBSIR 82-2485, April 1982.

Collins, B. L. and Pierman, P. C., *Evaluation of Safety Symbols.* NBSIR 79-1760, U.S. Department of Commerce, 1979.

Dreyfuss, H., "Case Study: Symbols for Industrial Use" in G. Kepes (ed.) *Sign, Image and Symbol,* New York: George Braziller, 1966, pp. 126-133.

Dreyfuss, H., *Symbol Sourcebook, An Authoritative Guide to International Graphic Symbols.* McGraw Hill, New York, 1972.

Easterby, R. S. and Swaga, H. I. G., *Evaluation of Public Information Symbols.* ISO Tests: 1975 Series, AP Report 60, March 1976.

Freedman, M. and Berkowitz, M. S., *Preliminary Report on Laboratory and Pilot Field Testing: Testing Criteria and Techniques of Evaluation for Passenger/Pedestrian Oriented Symbols for Use in Transportation Related Facilities.* DOT-OS-60071, FIRL No. C4448, January 1977.

ISO 3461-1976(E), *Graphic Symbols—General Principles for Presentation.* Geneva: International Organization for Standardization, 1976.

ISO 3864-1984, *Safety Colors and Safety Signs.* Geneva: International Organization for Standardization. 1984-03-01.

Kolers, P. A., "Some Formal Characteristics of Pictograms," *American Scientist,* Vol. 57, No. 3, 1969, pp. 348-363.

Mead, M. and Modley, R., "Communication Among All People, Everywhere," *Natural History,* Vol. 77, No. 7, 1968, pp. 56-63.

Modley, R., "Graphic Symbols for World-Wide Communication," in G. Krepes (ed.) *Sign, Image and Symbol,* New York: George Braziller, 1966, pp. 108-125.

Modley, R. and Myers, W. R., *Handbook of Pictorial Symbols.* New York: Dover Publications, 1976.

B-1.2.4 (For Chapter 4)

B-1.2.4.1 ANSI Publications. American National Standards Institute, 11 West 42nd St., New York, NY 10036.

ANSI Z35.1-1972, *Specifications for Accident Prevention Signs.*

ANSI Z35.4-1973, *Specifications for Informational Signs Complementary to ANSI Z35.1-1972, Accident Prevention Signs.*

B-1.2.4.2 Other Publications.

Collins, B. L. and Pierman, B. C., *Evaluation of Safety Symbols.* NBSIR 79-1760, U.S. Department of Commerce, 1979.

Dreyfuss, H., "Case Study: Symbols for Industrial Use" in G. Kepes (ed.) *Sign, Image and Symbol,* New York: George Braziller, 1966, pp. 126-133.

Dreyfuss, H., *Symbol Sourcebook, An Authoritative Guide to International Graphic Symbols.* McGraw Hill, New York, 1972.

Easterby, R. S. and Zwaga, H. I. G., *Evaluation of Public Information Symbols.* ISO Tests: 1975 Series, AP Report 60, March 1976.

Freedman, M. and Berkowitz, M. S., *Preliminary Report on Laboratory and Pilot Field Testing: Testing Criteria and Techniques of Evaluation for Passenger/Pedestrian Oriented Symbols for Use in Transportation Related Facilities.* DOT-OS-60071, FIRL No. C4448, January 1977.

ISO 3461-1976(E), *Graphic Symbols—General Principles for Presentation.* Geneva: International Organization for Standardization, 1976.

ISO/DIS 3864.3, *Safety Colors and Safety Signs.* Geneva: International Organization for Standardization, 1984-03-01.

Kolers, P. A., "Some Formal Characteristics of Pictograms," *American Scientist,* 57.3, 1969, pp. 348-363.

Mead, M. and Modley, R., "Communication Among All People, Everywhere," *Natural History,* Vol. 77, No. 7, 1968, pp. 56-63.

Modley, R., "Graphic Symbols for World-Wide Communication," in G. Kepes (ed.) *Sign, Image and Symbol,* New York: George Braziller, 1966, pp. 108-125.

Modley, R. and Myers, W. R., *Handsbook of Pictoral Symbols.* New York. Dover Publications, 1976.

B-1.2.5 (For Chapter 5)

Aetna Casualty and Life Company, "Plan Symbols," Hartford, CT, 1969.

American Institute of Architects, "A J Working Drawings Handbook - Technical Study 9," *The Architects' Journal*, May, 1977.

American National Standards Institute (ANSI Y32.2-1975), Canadian Standards Association (CSA Z99 - 1975), Institute of Electrical and Electronic Engineers IEEE (315 - 1975), "Graphic Symbols for Electrical and Electronics Diagrams" (adopted for mandatory use October 31, 1975 by Department of Defense, United States of America).

American Telephone and Telegraph Company. "Firesafety Symbols," Basking Ridge, NJ.

American Telephone and Telegraph, Proposed Bell System Practice 760-220-152, Building Planning, Basking Ridge, NJ, 1977.

Atwell, Vogel & Sterling, Inc., "NFPA Diagram Symbols," (Template), 1976.

Baltimore Fire Department Manual of Procedure, "Prefire Planning Sketches," Baltimore, MD, 1974.

Brand-Verhutungs-Dienst, "Symbols for Fire Protection Plans," Zurich, Switzerland, 1976.

British Standards Institute, "Graphic Symbols and Abbreviations for Fire Protection Drawings," B. S. 1635, London, England, 1970.

Brown & Root, Inc., "Firesafety Symbols," Houston, TX, 1978.

Canadian Standards Association, *Building Drawings,* (First) Draft C.S.A. B78.3-M, Rexdale, Ontario, Canada, 1977.

Construction Publishing Co., Inc., "Electrical Estimating Handbook," 1975.

Dutch Standard N.E.N. 1413, the Netherlands, "Symbols for Protection Against Fire on Building Drawings," Antwerp, Belgium, 1974.

Factory Mutual Engineering Association, Insurance Plan Manual, Norwood, MA, 1978.

Factory Mutual Insurance Co., "Graphic Symbols," Norwood, MA.

Fred S. James & Co., "Map Symbols," Chicago, IL.

Fremont, California Fire Department, "Fire Marshal's Office Standard Plan Symbols."

Grinnell Fire Protection Systems Company, Inc., "Graphical Standards."

Illinois Bell Telephone, "Fire Safety Symbols," Chicago, IL.

Improved Risk Mutuals, Firemen's Manual, White Plains, NY.

Improved Risk Mutuals, "Protection Symbols."

Improved Risk Mutuals, "Standard Abbreviations, Symbols, and Colors for Use on Insurance Plans," White Plains, NY.

Industrial Risk Insurers, "The Insurance Plan," Hartford, CT, 1968.

Insurance Services Offices, "Standard Plan Symbols," Chicago, IL, 1956.

Insurers' Advisory Organization of Canada, "Standard Key of Signs," Toronto, Ontario, Canada, 1977.

International Electrotechnical Commission, Pub. 117-3, 1977, "Graphical Symbols."

International Fire Service Training Association, "Fire Prevention and Inspection Practices," No. 110, Fourth Edition, Tulsa, OK.

International Fire Service Training Association, "Fire Problems in High Rise Buildings," Tulsa, OK.

International Standards Organization, ISO/DIS 40671/1, "Symbols for Plumbing, Heating, Ventilation and Ducting."

ISO/TC21/SC1/N18, "Working Draft - Graphical Symbols for Fire Protection Plans."

ISO/TC21/SC1 30E, "Proposal for Graphic Symbols."

ISO/TC21/SC1/WG1 - N27, "Graphical Symbols for Components of Automatic Fire Detection Systems."

Johnson Controls, Inc., "Abbreviations and Symbols," Milwaukee, WI.

Massachusetts Fire Alarms, Lowell, MA, "Fire Safety Symbols."

Metropolitan Government of Nashville and Davidson County, "Building Symbols," 1978.

Nashville, Tennessee Metropolitan Fire Dept., "Building Symbols."

National Automatic Sprinkler and Fire Control Association, Inc., "Symbol Standards."

National Electrical Manufacturers Association, NEMA Standard Pub. No. SB 1.1, 1969, "Symbols for Signaling, Protection and Communications Equipment."

National Fire Protection Association, *Fire Protection Handbook,* Seventeenth Edition, 1990.

National Fire Protection Association, *Inspection Manual,* Sixth Edition, Quincy, MA, 1989.

National Fire Protection Association, *National Fire Codes®,* Quincy, MA, 1993.

New Zealand Standard Association, "Building Drawing Practice—Engineering Services Maintenance and Fire Control Drawings" (proposed Part V of N.Z.S. 5902), Wellington, New Zealand.

Oklahoma State University, "OSU Safety Department Fire Alarm Symbols."

Phenix Technology, Inc., "Fire Pre-Planning Symbols."

Pyrotronics, Inc., Cedar Knolls, NJ, "Fire Alarm Symbols."

Salem, Massachusetts Fire Department, "Fire Alarm Symbols."

Santa Clara County, Procedures Manual, "F.M.O. Standard Plan Symbols," Santa Clara County, CA, 1973.

Signal Communications, Inc., "Fire Alarm Symbols."

Swiss Standard, "Symbols for Fire Protection Plans," November, 1977.

Taft Fire Control District, Taft, FL, "Standard Prefire Plan Symbols."

Texas Eastman Company, Longview, TX, "Symbols for Fire Protection Drawings."

University of Maryland, "Firemen's Training Course," Section II - Advanced, College Park, MD.

Appendix C Additional Explanatory Information on Chapters 1 through 5

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

C-1 Reserved.

C-2 Reserved.

C-3 Additional Explanatory Information on Chapter 3.

C-3.1 Symbol Testing (formerly Appendix B of NFPA 171).

Two or more versions of a symbol were developed for the referents listed in Chapter 3. The effectiveness of each of these symbols was evaluated by testing its meaningfulness (understandability) with groups of different participants. On the basis of these results, a symbol was selected for each referent. In some cases the symbols were refined graphically to incorporate modifications suggested by the test results. Symbol development and refinement included the efforts of research psychologists, graphic designers, safety engineers, and fire professionals.

The life safety symbols were tested in the course of several different research projects during a 7-year period. These results are referenced in a series of publications by the National Bureau of Standards. (See Appendix B-1.2.3.2.)

While a variety of testing procedures were used to assess understandability, the basic method consisted of asking people either to write down short definitions or to pick the correct definition from a set of carefully selected choices. In several studies, data on symbol preference and rated effectiveness also were obtained.

In these efforts, one set of participants consisted of 222 industrial personnel and 78 students; another set consisted of 271 miners and mine personnel; and another set consisted of 94 paid volunteers. No major differences between participant groups were observed for the symbols selected for Chapter 3 (formerly NFPA 171).

In addition to the studies of understandability, a detailed assessment was made of exit symbol visibility. This study used a laboratory optical viewing system to present a set of exit symbols included in a much larger set (108) of safety and information symbols. Three viewing conditions that simulated smoke were used (luminance of 0.085, 0.060, and 0.032 cd/m^2). Forty-two participants were familiarized with a randomly selected set of exit symbols to identify the separate effects of understandability and visibility. The symbol given in Chapter 3 was that symbol most frequently identified correctly under all three viewing conditions. In addition, the identification data were virtually the same whether participants had been familiarized with the symbol or not — suggesting that the symbol has high initial understandability. (This suggestion is reinforced by the high percentages of correct identification found in those studies that evaluated understandability.)

The results of the visibility testing program are important because an exit symbol must be both well understood and visible when under degraded viewing conditions (such as smoke).

The goal of the overall testing program was to identify versions or elements of symbols for the selected referents that appeared to be most effective in communicating the intended message. It is recognized that further education and/or supplemental word messages may be useful in optimizing the effectiveness of these symbols with the general public. Nevertheless, the symbols selected have demonstrated good initial understandability. Symbols for the referents generally showed good understandability (better than 85 percent correct identification). Symbols that presented some understandability problems included "No Exit" and "Fire Alarm Call Point." The examples shown herein, however, represent the imagery that was best understood. It is hoped that use of these images will strengthen public recognition.

It also should be noted that the symbol for handicapped accessibility was not tested in this program. It is, however, in an existing ANSI standard (A117.1) and has achieved wide use and good recognition.

C-4 Additional Explanatory Information on Chapter 4.

C-4.1 Symbol Testing (formerly Appendix B of NFPA 178). At least two versions of a symbol were developed for each of referents 4-2.1 through 4-2.7 (except 4-2.2), listed in Chapter 4 (referents 4-2.8 through 4-2.12 are discussed below). Subsequently, the effectiveness of the symbols was evaluated by testing their meaningfulness to groups of fire professionals (procedures outlined below). On the basis of the test results, a symbol was selected for each referent. This set of symbols was further refined graphically, incorporating modifications suggested by the test results. Symbol development and refinement through a Subcommittee on Visual Alerting Symbols included the efforts of fire professionals, graphic artists and designers, research psychologists, and safety engineers.

Symbols for referents 4-2.8 through 4-2.12 were adapted from ISO/TC231/SC1. The fire extinguisher symbol (4-2.10) was included in the test procedure. Although the standpipe outlet symbol (4-2.9) was not tested in isolation, it was incorporated as an element in two of the tested symbols (4-2.3 and 4-2.4).

Participants in the test program included fire professionals attending a national convention or local (Maryland) training classes (total of 86 participants). The test procedure involved two phases. In the first phase, the participants were shown one symbol at a time (in slide form) and were asked to write down a short definition of what they thought each symbol meant. In the second phase, two symbolic versions of each referent were shown together, and their intended meaning was provided; the participants indicated which version (if either) of each pair they felt better conveyed the meaning. They also were asked to give the reason for their preference and were free to offer any suggestions for improvement.

The goal of the testing program was to identify versions or elements of symbols for the selected referents that were most effective. It is recognized that education may be required to optimize the effectiveness of the symbols for fire fighters. Nevertheless, it is important to select symbols that initially are meaningful. Symbols for seven of the nine referents tested showed good recognizability (85-100%) and no serious confusion with other possible meanings. However, for two referents—wall hydrant and gas control valve—recognition was poor, and confusion was common for both symbolic versions of each message. Therefore, no symbol for these two referents is presented in this standard. Graphic improvements and alternative conceptions are being sought. [A symbol for a gas shutoff valve was accepted for the 1991 edition of NFPA 170 (now 4-2.8 in this document).]

C-4.2 The NFPA Committee on Fire Safety Symbols was able to identify a set of shapes for symbols to be used to direct responding fire fighters.

C-4.3 Pre-Fire Planning Symbols. These symbols are provided to assist fire suppression personnel who have the responsibility of preparing pre-fire plan sketches or diagrams.

The symbols can be reproduced with the use of templates and lettering guides. The shapes were chosen for the following reasons.

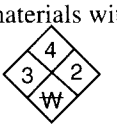
- Triangle symbols △ can point at a specific location or direction.

- Diamond symbols ◇ identify a specific location by touching a wall.

- Circle symbols ○ are used for all piping system appendatures, such as valves, since most pipes are round.

- Square Symbols □ are used for all room designations, as they represent most rooms having four sides.

The choice of lettering within the shapes was chosen for their ease of recall (i.e., SD - Smoke Detector).

NFPA 704, *Identification of the Fire Hazards of Materials*, may be used to identify the location of hazardous materials within the structure (i.e., 

).

Other features to complete the pre-fire plan sketch may be used from those provided in Chapter 5.

C-4.3 Pre-Fire Planning Symbols.

C-4.3.1 Access Features, Assessment Features, and Utility Shutoffs

C-4.3.1.1 *Access Features*

C-4.3.1.1.1 Fire Department Access Point ..... 

C-4.3.1.1.2 Fire Department Key Box ..... 

C-4.3.1.2 *Assessment Features*

C-4.3.1.2.1 Fire Alarm Annunciator Panel ..... 

C-4.3.1.2.2 Fire Alarm Reset Panel ..... 

C-4.3.1.2.3 Fire Alarm Voice Communication Panel ..... 

C-4.3.1.2.4 Smoke Control and Pressurization Panel ..... 

C-4.3.1.2.5 Sprinkler System Water Flow Bell ..... 

C-4.3.1.3 *Utility Shutoffs*

C-4.3.1.3.1 Electric Shutoff ..... 

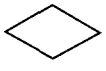
C-4.3.1.3.2 Domestic Water Shutoff ..... 

C-4.3.1.3.3 Gas Shutoff ..... 

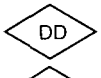
Specific Variations:

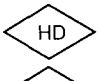
C-4.3.1.3.3(a) LP-Gas Shutoff ..... 

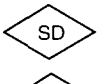
C-4.3.1.3.3(b) Natural Gas Shutoff ..... 

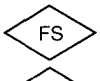


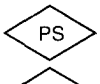
C-4.3.2 Fire Alarm Detection Equipment

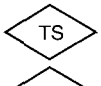
C-4.3.2.1 Duct Detector ..... 

C-4.3.2.2 Heat Detector ..... 

C-4.3.2.3 Smoke Detector ..... 

C-4.3.2.4 Flow Switch (Water) ..... 

C-4.3.2.5 Manual Pull Station ..... 

C-4.3.2.6 Tamper Switch ..... 

C-4.3.2.7 Halon System ..... 

C-4.3.2.8	Dry Chemical System	DC
C-4.3.2.9	CO_2 System	CO_2
C-4.3.2.10	Wet Chemical System	WC
C-4.3.2.11	Foam System	FO

C-4.3.3 Water Flow Control Valves

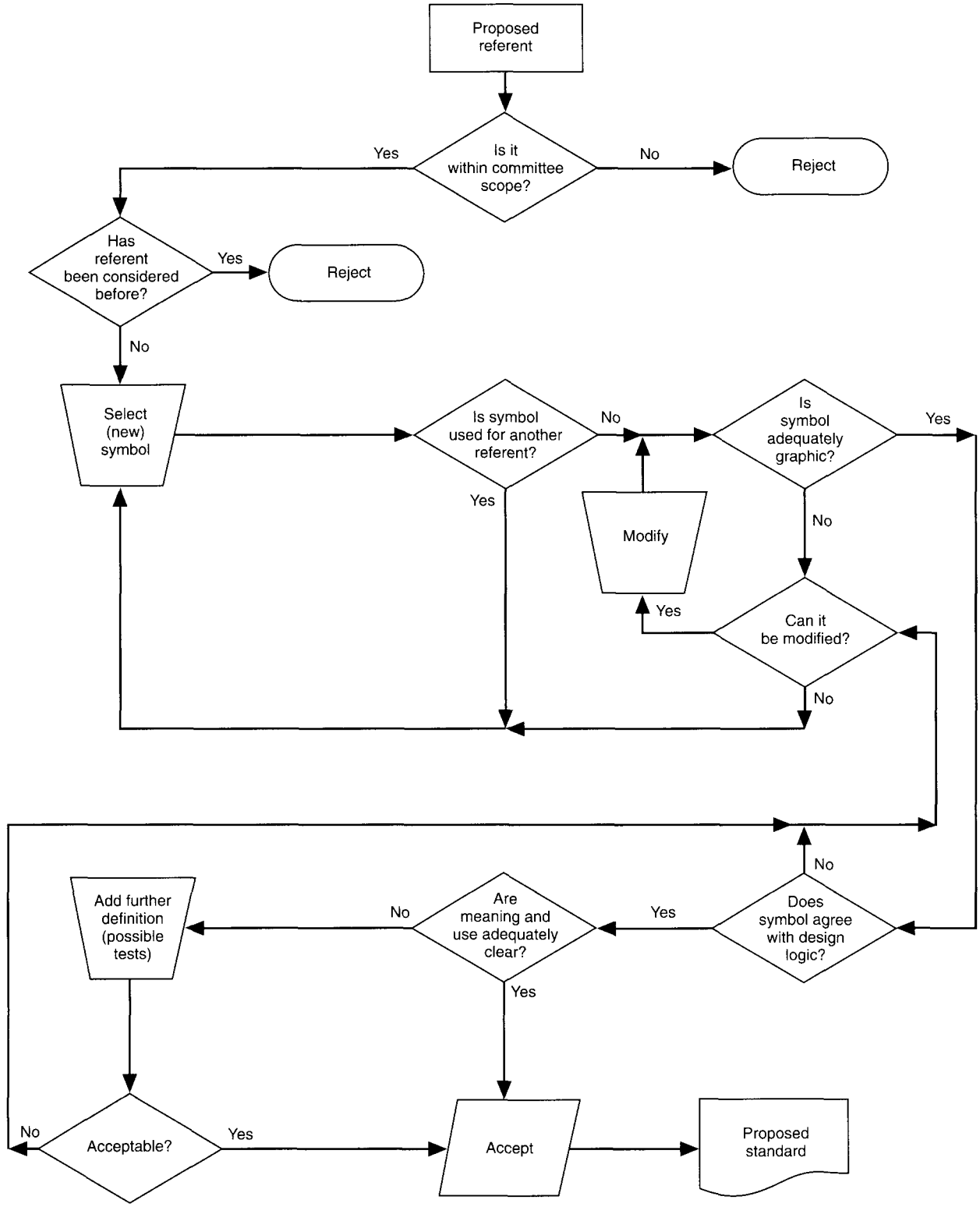
C-4.3.3.1	Post Indicator Valve	PIV
C-4.3.3.2	Riser Valve	RV
C-4.3.3.3	Sprinkler Zone Valve	ZV
C-4.3.3.4	Hose Cabinet or Connection	HC
C-4.3.3.5	Wall Hydrant	WH
C-4.3.3.6	Test Header (Fire Pump)	TH
C-4.3.3.7	Inspector's Test Connection	TC
C-4.3.3.8	Fire Hydrant	FH
C-4.3.3.9	Fire Department Connection	FDC
C-4.3.3.10	Drafting Site	DS

C-4.3.4 Equipment Rooms

C-4.3.4.1	Air Conditioning Equipment Room (AHUs – Air Handling Units)	AC
C-4.3.4.2	Elevator Equipment Room	EE
C-4.3.4.3	Emergency Generator Room	EG
C-4.3.4.4	Fire Pump Room	FP
C-4.3.4.5	Telephone Equipment Room	TE
C-4.3.4.6	Boiler Room	BR
C-4.3.4.7	Electrical/Transformer Room	ET

C-5 Additional Explanatory Information on Chapter 5.

C-5.1 Symbol Selection Procedure.



C-5.2 Discussion of Basic Symbols.

Table C-5.2 Basic Symbol Shapes and Relative Sizes

General Referent	Shape	Relative Size†	Comments
	MAJOR ELEMENTS		
Automatically Actuating Systems		5/32" dia.	Detection, extinguishment
Manually Actuating Systems		5/32" square	Manual alarm system
Control Panel		5/32" x 5/16"	Supplementary element is used to describe the panel.
Portable Fire Extinguisher		3/15" sides	Supplementary element is used to further describe the extinguisher.
Fire Fighting Equipment		1/4" sides	Supplementary element is used to describe a specific device.
	SUPPLEMENTARY ELEMENTS		
Water System Components		3/32" dia.	General shape, a circle. Shading of this element indicates a wet device.
Foam Agent		3/16" dia.	
Dry Chemical Agent		3/32" square	
Gaseous Agent		1/8" sides	
Nozzle			Used on pipe or other symbol.
Pressure Notation			Used with another symbol shape, such as a detector or a tank.

(continued on next page)

†Relative is emphasized, since it is not the intent here to specify actual dimensions. For comparisons, this column gives the sizes at which the symbols are presented here.