ANSI/NFPA 299 An American National Standard August 16, 1991

NFPA 299 Protection of Life and Property from Wildfire 1991 Edition

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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 299

Standard for

Protection of Life and Property from Wildfire

1991 Edition

This edition of NFPA 299, *Standard for Protection of Life and Property from Wildfire*, was prepared by the Technical Committee on Forest and Rural Fire Protection and acted on by the National Fire Protection Association, Inc. at its Annual Meeting held May 19–22, 1991 in Boston, MA. It was issued by the Standards Council on July 19, 1991, with an effective date of August 16, 1991.

The 1991 edition of this document has been approved by the American National Standards Institute.

Origin and Development of NFPA 299

NFPA 299, *Standard for Protection of Life and Property from Wildfire*, is a new standard. It was developed by the Forest and Rural Fire Protection Committee following the tragic wildfires that resulted in the loss of 44 lives and 1,400 homes in the United States in 1985. The purpose of this standard is to provide criteria for fire agencies, land use planners, architects, developers, and local government for firesafe development in areas that may be threatened by wildfire.

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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.

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Protection of Life and Property from Wildfire

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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 9 and Appendix C.

Chapter 1 Introduction

1-1 Scope. This standard presents minimum planning criteria for the protection of life and property from wildfire. It includes information on safe procedures and practices at the wildland/urban interface or intermix.

1-2 Purpose. The purpose of this standard is to provide criteria for fire agencies, land use planners, architects, developers, and local government for firesafe development in areas that may be threatened by wildfire.

1-3 Definitions. For the purpose of this standard, the following terms have the meanings shown below:

Access Routes. Principal vehicular ingress and egress to a structure or through a development, crossing more than one parcel, including public and private roads, streets, and lanes, that extend to and intersect with a publicly maintained road, street, or lane.

Accessory Building or Structure. Any building or structure used incidentally to another building or structure.

Aerial Fuels. Standing and supported live and dead combustibles not in direct contact with the ground and consisting mainly of foliage, twigs, branches, stems, cones, bark, and vines.

Approved.* Acceptable to the "authority having jurisdiction."

Aspect. Direction toward which the slope faces.

Authority Having Jurisdiction.* The "authority having jurisdiction" is the organization, office or individual responsible for "approving" equipment, an installation or a procedure.

Average Daily Traffic (ADT). The average daily volume of vehicles traveling on a given road.

Brush. Shrubs and scrub vegetation or other growth heavier than grass but not full tree size.

Building. Any structure used or intended for supporting any use or occupancy.

Classified Roof. A roof constructed with a roof covering that is listed as meeting the requirements for Class A, B, or C roof covering materials (*see NFPA 256, Standard Methods of Fire Tests of Roof Coverings*).

Combustible. Any material that, in the form in which it is used and under the conditions anticipated, will ignite and burn.

Development. Human-made improvement of property.

Driveway. Vehicular ingress and egress routes that serve no more than 2 buildings or structures, not including accessory structures, on one parcel, containing no more than 3 dwelling units.

Dwelling Unit. Any building or structure or portion thereof that contains living facilities with provisions for sleeping, eating, cooking, and sanitation for not more than 1 family.

Fire Hydrant. A valved connection on a piped water supply system having one or more outlets and that is used to supply hose and fire department pumpers with water.

Fuel Break. An area, usually a long strip strategically located, wherein vegetative fuels are reduced in volume and maintained to cause a reduction of fire intensity if ignited by a wildland fire.

Fuel Loading. The volume of fuel in a given area, generally expressed in tons per acre.

Fuel Modification. The removal of fuels, conversion of vegetation to fire-resistant species, increased spacing of individual plants, reduction of fuel loading, or lowering of age class.

Fuels. All Class A fuels within the wildland/urban interface or wildland/urban intermix, including vegetation and structures.

Ground Fuels. Any native or landscape vegetation not considered a tree and generally in contact with the ground.

Hammerhead-T. A roadway that provides a "T" shaped, three-point turnaround for emergency equipment, being no narrower than the road that it serves, with the top of the "T" being a minimum of 40 ft (12.2 m) long.

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.

Noncombustible. A material that, in the form in which it is used and under the conditions anticipated, will not aid combustion or add appreciable heat to an ambient fire. Materials tested in accordance with *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C (1382°F)*, ASTM E136, and conforming to the criteria contained in Section 7 of the referenced standard shall be considered as noncombustible.

Occupancy. The purpose for which a building, or part thereof, is used or intended to be used.

Prescribed Fire. The knowledgeable application of fire to a specific land area, to accomplish predetermined land management objectives.

Roads, Streets, Private Lanes. An open way for passage of vehicles giving access to more than one parcel, any industrial or commercial occupancy, or to a single parcel with 4 or more dwelling units.

Roadway. Any surface improved, designed, or ordinarily used for vehicular travel.

Shoulder. Surface of a road adjacent to the traffic lane.

Slope. Upward or downward incline or slant, usually calculated as a percent of slope [rise or fall per 100 ft (30.5 m) of horizontal distance].

Street or Road Signage. Any sign containing words, numbers, directions, or symbols that provides information to emergency responders.

Structure. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

Traffic Lane. That portion of a roadway that provides a single lane of vehicle travel in one direction.

Traveled Way. The portion of a roadway that provides for vehicular travel in all permitted directions.

Turnaround. A roadway, unobstructed by parking, that allows for a safe reversal of direction for emergency equipment.

Turnouts. A widening in a roadway of sufficient length and width to allow vehicles to pass one another.

Wildland/Urban Interface. An area where development and wildland fuels meet at a well-defined boundary.

Wildland/Urban Intermix. An area where development and wildland fuels meet with no clearly defined boundary.

Wildfire. An unplanned and unwanted fire requiring suppression action; an uncontrolled fire, usually spreading through vegetative fuels but often threatening structures.

Chapter 2 Wildland/Urban Interface and Wildland/Urban Intermix Analysis

2-1* General. The analysis of the wildland/urban interface or wildland/urban intermix will help identify and document local problem areas and guide the application of standards and establishment of priorities relative to fire danger.

2-2 Analysis Ratings. The authority having jurisdiction shall perform a wildland fire protection analysis of all developments, existing or planned, to determine wildland fire protection ratings. The ratings developed under the authority of this section shall be the basis for the implementation of firesafe design and construction criteria. The higher the relative value, the higher the wildland/urban interface or wildland/urban intermix hazard rating.

2-3 Analysis Components. The analysis shall contain the following components:

(a) Wildland/urban interface or wildland/urban intermix boundaries

(b) Fuel hazard rating

(c) Slope hazard rating

(d) Structure hazard rating

(e) Additional factors rating

(f) Wildland/urban interface or wildland/urban intermix hazard rating.

2-3.1* Mapping Wildland/Urban Interface or Wildland/Urban Intermix Areas. Areas shall be delineated as logical units or areas and given a name or number.

2-3.2 Assigning a Fuel Hazard Rating. For each wildland/urban interface and wildland/urban intermix area, a fuel hazard rating shall be assigned based on Table 2-3.2. Where fuel types vary within an area, the rating assigned for the area shall be that which best represents the predominant fuel type.

Table 2-3.2 Fuel Hazard Rating

Type	Rating
Small, light fuels (grass, weeds, shrubs)	1
Medium size fuels (brush, large shrubs, small trees)	2
Heavy, large fuels (woodland, timber, heavy large brush)	3

2-3.3 Assigning a Slope Hazard Rating. For each wildland/urban interface and wildland/urban intermix area, a slope hazard rating shall be assigned based on Table 2-3.3. Where slopes vary within an area, the rating for the area shall be that which best represents the predominant slope range.

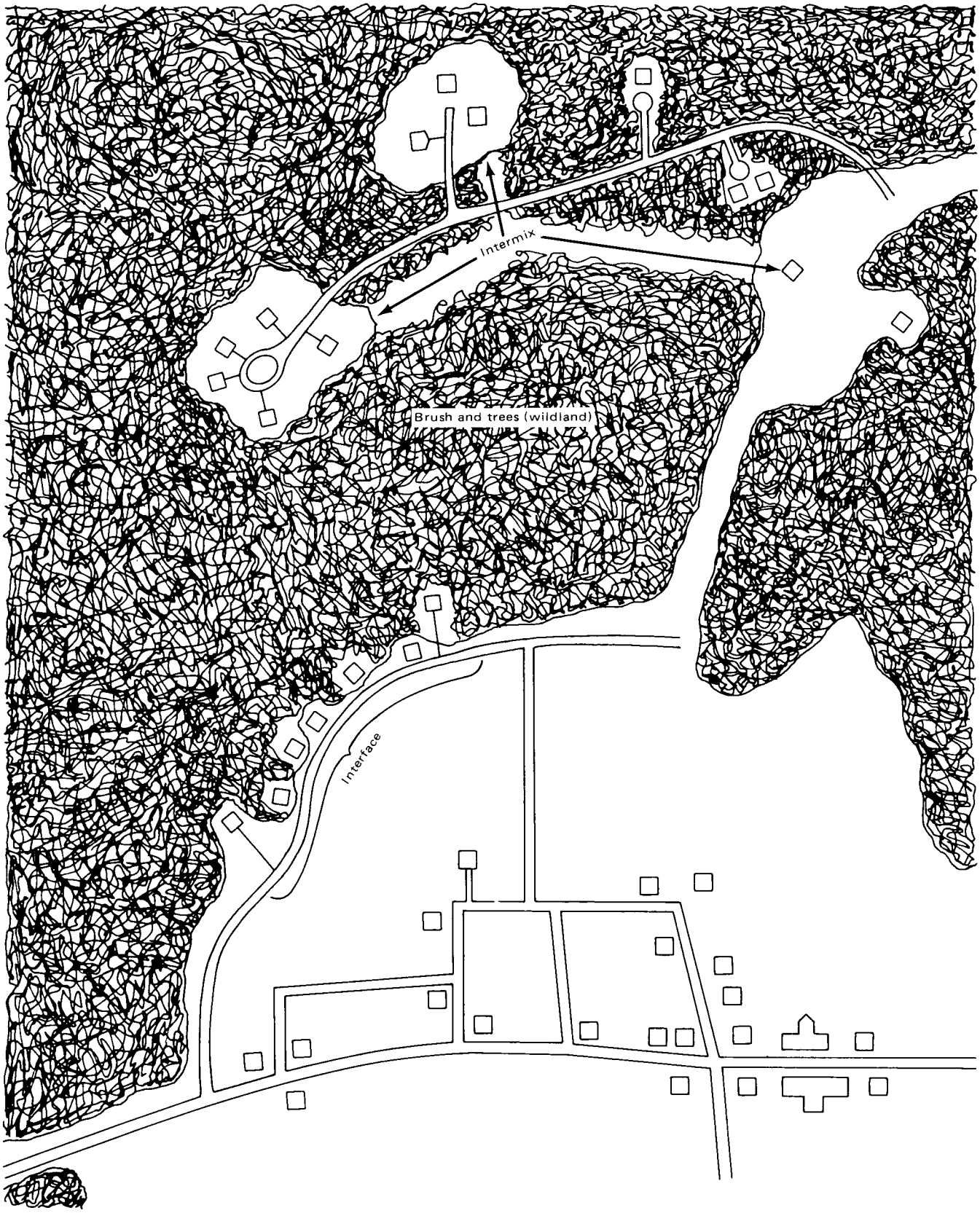

Figure 2-1 Wildland/urban interface and wildland/urban intermix.

Table 2-3.3 Slope Hazard Rating

Slope	Rating
Mild slopes (0-5%)	1
Moderate slopes (6-20%)	2
Steep slopes (21-40%)	3
Extreme slopes (41% and greater)	4

2-3.4 Assigning a Structure Hazard Rating. For each wildland/urban interface and wildland/urban intermix area, a structure rating that best represents the combination of design characteristics in each unit or area shall be assigned based on Table 2-3.4. Ratings occurring between those shown in the table shall be assigned where they represent areas of mixed structures.

Table 2-3.4 Structure Hazard Rating

Design Characteristics	Rating
Classified roof and noncombustible siding materials	1
Classified roof and combustible siding materials	3
Unclassified roof and noncombustible siding materials	7
Unclassified roof and combustible siding materials	10

2-3.5* Assigning an Additional Factor Rating. Where other factors influence community needs and where determined to be appropriate by the authority having jurisdiction, an additional factor rating shall be assigned based on Table 2-3.5. Other factors that shall be permitted to be considered in addition to those listed in the table include: water supplies, road access, and fire behavior. NFPA 1141, *Standard for Fire Protection in Planned Building Groups*, and NFPA 1231, *Standard on Water Supplies for Suburban and Rural Fire Fighting*, shall be permitted to be utilized.

Table 2-3.5 Additional Factor Rating

Additional Factor	Rating
Rough topography that contains several steep canyons	+2
Areas having a history of higher fire occurrence than surrounding areas due to special situations such as heavy lightning, railroads, escaped debris burning, arson, etc.	+3
Areas that are periodically exposed to unusually severe fire weather such as strong winds.	+4
Existing areas where fuel modification or fuel breaks provide usable fire control points or protection to structures or wildland.	−3
Areas where local facilities such as developed water systems, fire trucks, dozers, or local organizations provide additional protection to structures or wildland.	−3

2-3.6 Calculating the Wildland/Urban Interface or Wildland/Urban Intermix Hazard Rating. The wildland/urban interface or wildland/urban intermix hazard rating shall be calculated for each area by multiplying the fuel hazard rating by the slope hazard rating, adding the structure hazard rating to the subtotal, and then adding or subtracting the additional factor rating from the total.

2-4 Establishing Wildland/Urban Interface or Wildland/Urban Intermix Planning Priorities. The relative wildland/urban interface or wildland/urban intermix hazard of each area shall be rated from highest to lowest.

Chapter 3 Fuel Modification Planning

3-1 General. This chapter will provide guidance in the mitigation of measures associated with fuel hazards and special hazard conditions. Fuel modification shall be the primary mitigation measure.

3-2 Evaluation Factors. As prescribed in Chapter 2 of this standard, a comprehensive assessment of the fuel hazard shall be made. Factors that shall be considered in the assessment and designated on maps include:

(a) Fuel-type identification

(b) Fuel loading (volume)

(c) Size of fuel bed (acres)

(d) Slope and aspect.

3-2.1 Fuel-Type Identification. All fuel, natural vegetation, as well as other flammable materials existing within the area shall be identified and rated as to its potential to increase the hazard. The ease of ignition and ability to assist in the spread of fire are important factors.

3-2.2 Fuel Loading. The volume of fuels, both presently existing and likely to be present under expected development, shall be estimated and included on maps.

3-2.3 Slope. Percent of slope and aspect shall be determined and indicated on maps.

3-2.4* Fuel Modification. The purpose of the fuel modification effort shall be to develop defensible space to protect structures from approaching wildfire as well as to reduce the potential for a structure fire spreading to the wildland. The defensible space shall be initially provided by the developer and shall be maintained by the property owner.

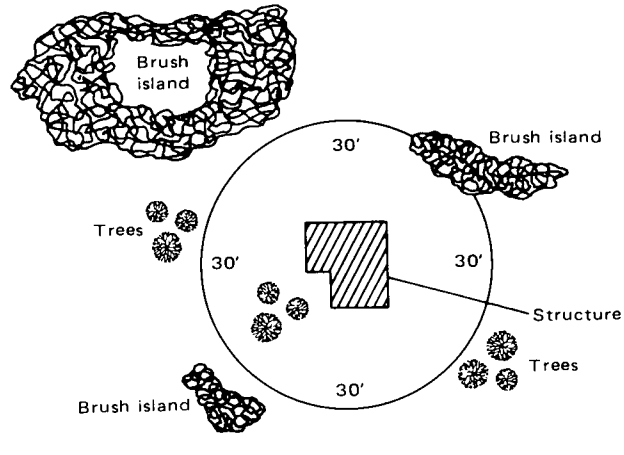

Figure 3-2.4(a) Defensible space (level).

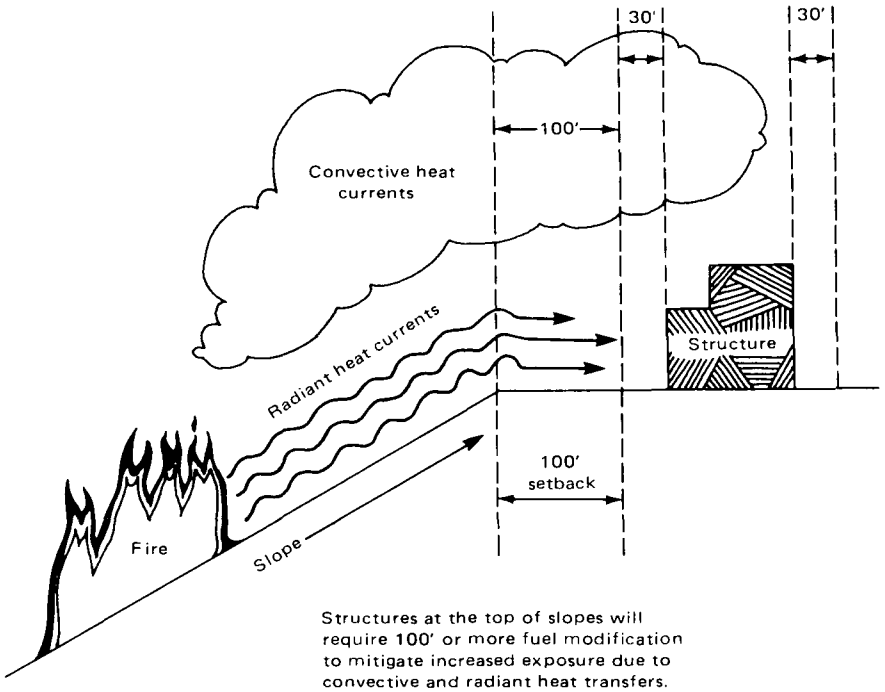

Figure 3-2.4(b) Defensible space (slope).

3-3* Fuel Modification Plan. [See Appendix A, Figures A-3-3(a)–(d).]

3-3.1* Modification of Fuel Types. Where consistent with ecological factors, less fire-prone vegetation shall be encouraged.

3-3.2 Reduction of Fuel Loading. Trees and brush shall be cleared away from structures for a distance that is determined to prevent ignition of either the structure or the vegetation, should the other burn. Vegetation existing away from the immediate area of the structure shall be thinned and pruned to prevent a fire from being carried toward or away from the structure. Annual grasses within 30 ft (9.1 m) of structures shall be mowed to 4 in. (101.6 mm) or less. Ground litter shall be removed annually. Over-mature, dead, and dying trees shall be evaluated as to their potential to ignite and to carry fire. All trees determined to contain such potential shall be removed.

3-3.3 Mitigation of Slope and Aspect Impact. Slope and aspect greatly affect the potential for carrying fire, and very little opportunity exists to modify them directly. Where degree of slope or aspect are determined to affect the hazards, greenbelts or fuel breaks shall be provided.

Chapter 4 Roads, Streets, and Ways

4-1 General. Roads, streets, and ways, whether public or private, shall provide for safe simultaneous access for emergency fire equipment and civilian evacuation. The authority having jurisdiction shall be permitted to allow modification of access requirements where the structures being protected are provided with private fire protection systems.

4-2 Roads, Streets, and Ways. Roads, streets, and ways shall provide for unobstructed traffic circulation during an emergency. Access to fuel breaks and greenbelts, where required by the authority having jurisdiction, shall be provided from roads, streets, and ways. All vehicular access and gates servicing such access shall meet the specifications provided herein. All roads shall be designed and constructed according to standards published by the American Association of State Highway and Transportation Officials but shall also meet the minimum requirements set forth in this document.

4-3 Private Roads, Streets and Ways, Fire Lanes, Parking Lots, and Driveways. All fire lanes, private streets, parking lots, and driveways shall be designed and constructed according to NFPA 1141, *Fire Protection for Planned Building Groups*.

4-4 Specific Design Requirements.

4-4.1 Access Routes. All developments shall have more than one access route. The design of access routes shall consider traffic circulation and employ looped road networks.

4-4.2 Public Vehicular Easements and Rights-of-Way.

(a) Public vehicular easements and rights-of-way shall be of sufficient width to accommodate the traveled way, shoulder, parking spaces, vegetation modification, and other local requirements on or along a road, street, or way.

(b) Easements shall be obtained from adjacent property owners where needed to comply with paragraph (a) above.

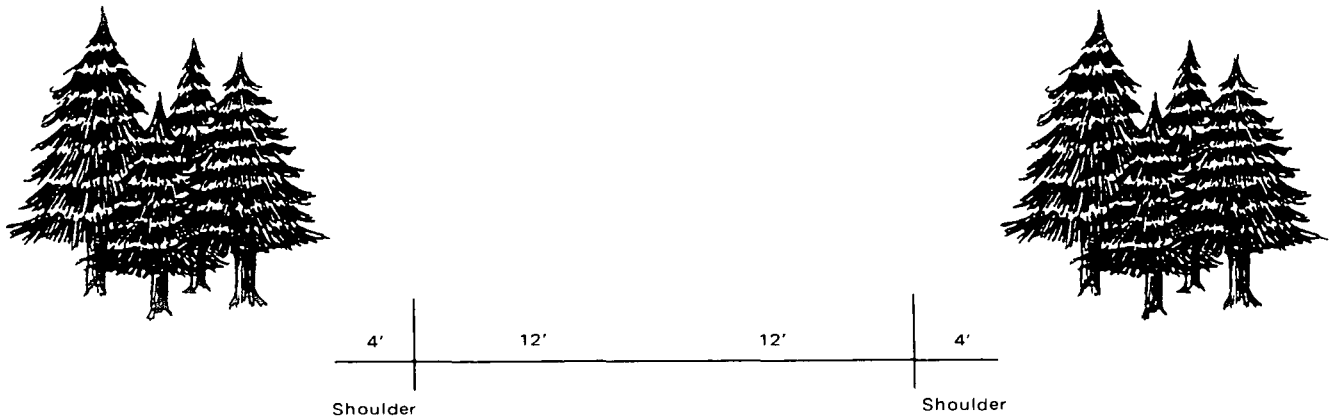

Figure 4-4.4 Traffic lanes all-weather surface.

4-4.3 Road Surface. All roads and road structures shall be graded and surfaced and of sufficient design to support the weight of 20-ton vehicles.

4-4.4 Width of Traveled Way. Simultaneous access for emergency vehicles and the evacuation of residents shall be provided for by a traveled way of not less than 24 ft (7.3 m).

4-4.5 Maximum Grades. Grades shall be no greater than 10 percent, except the authority having jurisdiction shall be permitted to allow steeper grades where mitigation measures can be agreed upon by the fire chief and the road engineer.

4-4.6 Minimum Grades. Roads shall have a minimum grade of not less than 0.5 percent in order to prevent pooling of water in the traveled way. Drainage shall be provided to protect a primary road where it intersects with a secondary road.

4-4.7 Curve Radius. No roads shall be constructed with a curvature radius of less than 100 ft (30.5 m), measured at the center line.

4-4.8 Shoulders.

(a) Improved gravel shoulder width shall be a minimum of 4 ft (1.2 m) on each side of the traveled surface.

(b) On roads with an average daily traffic in excess of 1000 vehicles per day, shoulders shall be constructed to the same specifications as the traveled way.

4-4.9 Parking. Where parking is to be allowed along the traveled way, at least 9 ft (2.7 m) of improved width shall be provided (see Figure 4-4.4). If curbs are not provided, the shoulder shall be constructed according to 4-4.8.

4-4.10 Dead-End Roads.

(a) In areas of extreme hazard severity classification, as identified in the wildland/urban interface and wildland/urban intermix assessment in Chapter 2, dead-end roads shall not exceed 600 ft (183 m) in length.

(b) In all other areas, dead-end roads shall not exceed 1000 ft (305 m) in length.

(c) All dead-end roads shall have a turnaround at the closed end of at least 100 ft (30.5 m) in diameter, measured at the outside of the traveled way. However, where wildfire hazard severity is classified as low, the authority having jurisdiction shall be permitted to approve a hammerhead-T designed turnaround to provide emergency vehicles with a 3-point turnaround ability.

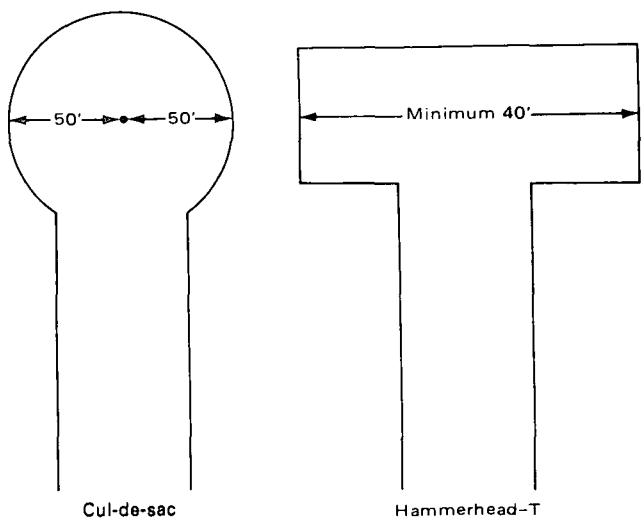

Figure 4-4.10 Cul-de-sac and hammerhead-T turnarounds.

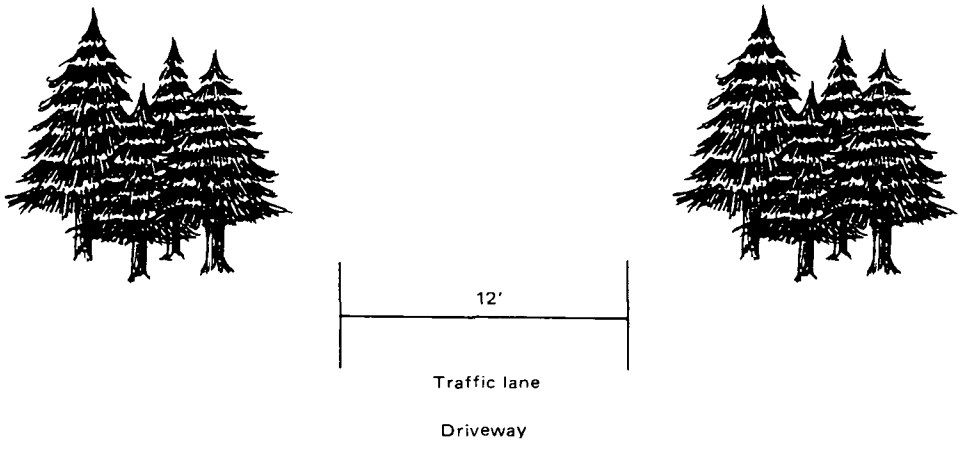

Figure 4-4.11 Driveways.

4-4.11 Driveways.

(a) All driveways shall provide a minimum unobstructed width of 12 ft (3.7 m) and minimum unobstructed vertical clearance of 15 ft (4.6 m).

(b) All curb cuts at entrances to driveways or other private ways shall be of sufficient width to permit safe travel by emergency vehicles at all times of year.

(c) Turnouts shall be designed and constructed every 400 ft (122 m) along the driveway's length.

(d) A turnaround shall be provided at all building or structure sites on driveways over 300 ft (91 m) in length and shall be within 50 ft (15.2 m) of the building or structure.

(e) In addition, where applicable, all driveways shall conform with NFPA 1141.

4-4.12 Gated Entrances.

(a) The clear opening provided through the gate shall be 2 ft (0.6 m) wider than the traveled way.

(b) All gates shall be located at least 30 ft (9.1 m) from the public right-of-way and shall open inward, allowing a vehicle to stop without obstructing traffic on the public road.

Chapter 5 Standards for Signage of Streets, Roads, and Buildings

5-1 General. To facilitate the locating of a fire and to avoid delays in response, all roads, streets, and buildings shall be designated by names or numbers on signs clearly visible and legible from the roadway on which it is addressed.

5-2 Visibility of Street and Road Signs. Street and road signs shall be located at intersections and legible from all directions of vehicle travel for a distance of not less than 100 ft (30.5 m).

5-3 Size of Letters, Numbers, and Symbols for Signs. All letters, numbers, and symbols shall be a minimum of 4 in. (101.6 mm) in height, with a ½-in. (12.7-mm) stroke, and shall be reflectorized and contrasting with the background color of the sign.

5-4 Height of Street and Road Signs. Signs shall be mounted 6 to 8 ft (2 m) above the surface of the road, unless local conditions or existing standards prescribe otherwise.

5-5 Names and Numbers on Street and Road Signs. Newly constructed or approved public and private roads and streets shall be identified by a name or number in a consistent system that provides for sequenced or patterned numbering and nonduplicated naming within each jurisdiction.

5-6 Signs Indicating Special Conditions. On other than through-traffic roads, signs identifying pertinent information shall be placed at the entrance to such roads.

5-7 Installation of Road and Street Signs. Signs shall be installed in a horizontal orientation and prior to final acceptance of road improvements.

5-8 Addresses for Buildings. All buildings shall be issued an address and street number by the authority having jurisdiction. Accessory structures shall be required to have a separate address.

5-9 Size of Letters, Numbers, and Symbols. Letters, numbers, and symbols indicating addresses shall be a minimum of 4 in. (101.6 mm) in height with a ½-in. (12.7-mm) stroke, shall be contrasting with background colors, and shall be visible from the road.

Chapter 6 Emergency Water Supplies

6-1 General. This chapter describes the process by which provisions for emergency water supplies shall be evaluated, designed, constructed, and maintained.

6-2 Notification. The authority having jurisdiction shall be notified in writing before any water system is constructed, altered, or removed and before site development or construction of any structure commences so that fire protection can be evaluated and ample water supply capabilities pertinent to such construction can be established.

6-3 Evaluation of Water Supply Needs.

6-3.1 Authority. The fire protection agency having jurisdiction shall evaluate all buildings, proposed and existing, to obtain information required for computing minimum water supply. Information obtained from plans or on-site surveys and determinations made and recorded shall reflect the water supply category required. The computation of minimum water supplies for other than municipal, domestic, or fixed fire protection systems shall be in accordance with NFPA 1231.

6-3.2 Design, Construction, and Maintenance. Based upon the water supply evaluation, the authority having jurisdiction shall approve the design, construction, and maintenance of water supplies and distribution systems to ensure that fire protection concerns have been addressed and adequate water supplies and access thereto have been provided.

6-4 Minimum Water Supply Requirements. Water shall be available to provide a minimum fire flow of 250 gpm (946 L/min) for 2 hr.

6-5 Static Water Supplies. The design and construction of and access to static water supplies shall be in accordance with NFPA 1231.

6-6 Signage of Water Supplies. Each fire hydrant or access to water shall be identified as follows:

(a) A reflectorized marker, with a minimum dimension of 3 in. (76.2 mm), shall be located on the driveway address sign signifying the hydrant location and on a fire-retardant post located near the fire hydrant, and

(b) A fire-retardant reflectorized sign with the words "DRAFT WATER" or "PRESSURE WATER" having letters a minimum of 4 in. (101.6 mm) in height, with ½-in. (12.7-mm) stroke, reflectorized and contrasting to the background color, shall be located near the hydrant or access to water.

(c) The signpost shall be within 3 ft (0.9 m) of said fire hydrant or access to water, with the sign no less than 3 ft (0.9 m) nor greater than 5 ft (1.5 m) above the ground and visible from the driveway.

Chapter 7 Structural Design and Construction

7-1 General. All buildings in the wildland/urban interface or wildland/urban intermix shall be designed and constructed to comply with one of the model building codes and with this standard.

7-1.1 Minimum Requirements. Structures and developments in or adjacent to wildland fire hazard areas shall be located, designed, and constructed in a manner to minimize the possibility of ignition from a wildfire and to minimize the spread of a structural fire to the wildland.

7-2 Roofing. Roof coverings shall be a minimum of Class C. Subdivision covenants, conditions, and restrictions shall not require the use of roof covering materials that do not meet Class C requirements.

7-3 Vents, Overhangs, and Stilt Construction.

7-3.1 Vents. Vents shall be screened with a corrosion-resistant, noncombustible wire mesh with the mesh not to exceed nominal ¼ in. (6.35 mm) in size.

7-3.2 Overhangs. Eaves, cantilever balconies, and similar undersides of overhangs shall be enclosed with materials that equal or exceed ½-in. (12.7-mm) nominal sheathing.

7-3.3 Stilt Construction. The underside of decks and structures with stilt foundations shall be enclosed with the material specified in Section 7-4.

7-4 Exterior Vertical Walls. Exterior vertical walls shall be constructed of at least ½-in. (12.7-mm) nominal sheathing or equivalent material and shall extend from ground level to roof line.

7-5 Glazed Openings. All glazed openings that face concentrations of vegetative fuels within 30 ft of the openings shall be provided with closable, solid exterior shutters.

7-6 Chimneys and Flues.

7-6.1 Outlet Screen. Every chimney, flue, or vent shall be provided with an approved spark arrester consisting of 12-gauge welded or woven wire mesh not exceeding ½ in. (12.7 mm).

7-6.2 Construction. Chimney outlets shall be constructed with 10-ft (3.1-m) clearance from all vegetation and obstructions.

7-7 Manufactured Homes. Manufactured homes shall meet all applicable construction and safety standards and shall be provided with full skirting constructed of material as specified in Section 7-4. Any porches and sundecks shall be constructed of nonflammable or listed fire-retardant materials.

Chapter 8 Public Fire Prevention and Firesafety Information and Education

8-1 Information and Education Plan. The authority having jurisdiction shall prepare a year-round fire prevention and firesafety public information/education plan. The plan, at a minimum, shall identify and analyze:

(a) Specific hazards
(b) Risks
(c) Fire causes
(d) Applicable prevention and safety programs
(e) Target audiences
(f) Activities.

The plan shall utilize a variety of communication techniques to achieve desired objectives. (*See Appendix B for a sample public information/education program and delivery techniques.*)

Chapter 9 Referenced Publications

9-1 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.

9-1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NFPA 256, *Standard Methods of Fire Tests of Roof Coverings*, 1987 edition

NFPA 1141, *Standard for Fire Protection in Planned Building Groups*, 1990 edition

NFPA 1231, *Standard on Water Supplies for Suburban and Rural Fire Fighting*, 1989 edition

Appendix A

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

A-1-3 Approved. 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 or 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 which is in a position to determine compliance with appropriate standards for the current production of listed items.

Authority Having Jurisdiction. 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, 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 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."

Listed. 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.

A-2-1 Weather is the most critical element. Wind, wind direction, and frontal activity are the prime factors in most major wildland fires. The topography element key issue is slope. Slope modifies fire spread and creates more drafting and preheating ahead of the fire. Slopes over 50 percent are especially critical.

Fuel beds should be evaluated in terms of continuity, arrangement, and fire history. Additionally, fuel beds in heavy brush and/or woodland-timber should be evaluated for abundance of down or dead fuels.

Response times are an indirect factor that should be evaluated specially in a developing wildland/urban interface. An important question that must be asked is: Can resources and personnel arrive in time to protect structures and valued resources prior to the fire?

A-2-3.1 The map should show elevations (slope contours). A color coding system should be used to show grasslands (yellow), medium brush (blue), heavy brush (red), and woodland or timber (green).

A-2-3.5 Table A-2-3.5 shows an example of the calculations for several sample units or areas.

Table A-2-3.5 Wildland/Urban Interface or Wildland/Urban Intermix Hazard Rating

Unit	Fuel Hazard × Rating	Slope Hazard + Rating	Structure Hazard = Rating	Interface Hazard Rating
Dunville	2	4	9	17
Jerry Flat	3	2	6	12
Crossroads	2	3	5	11
Hope Lake (a)	3	1	3	6
Hope Lake (b)	1	3	2	5
T Valley	1	1	2	3

A-3-2.4 Abnormal accumulations of down or dead fuels, caused by age class, snow kill, and disease may be color coded (brown) and plotted on the map. These areas can be addressed with a fuel management program discussed in Chapter 4 of this standard.

A-3-3 See Figures A-3-3(a)–(d).

A-3-3.1 An example would be the substitution of perennial grasses to annuals.

Examples of fuel modification

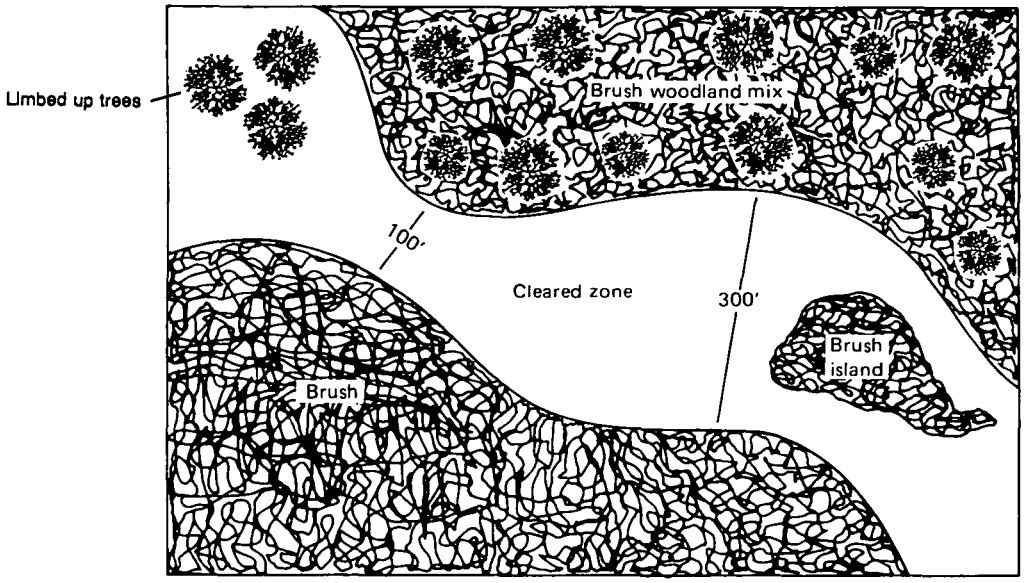

Figure A-3-3(a) Fuel break.

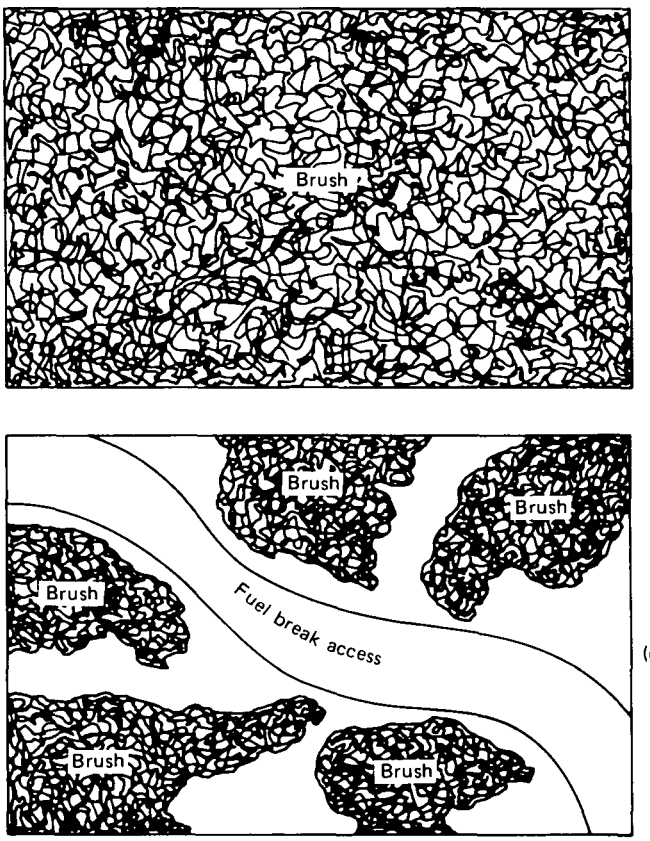

Figure A-3-3(b) Wildland fuel bed unmodified and modified.

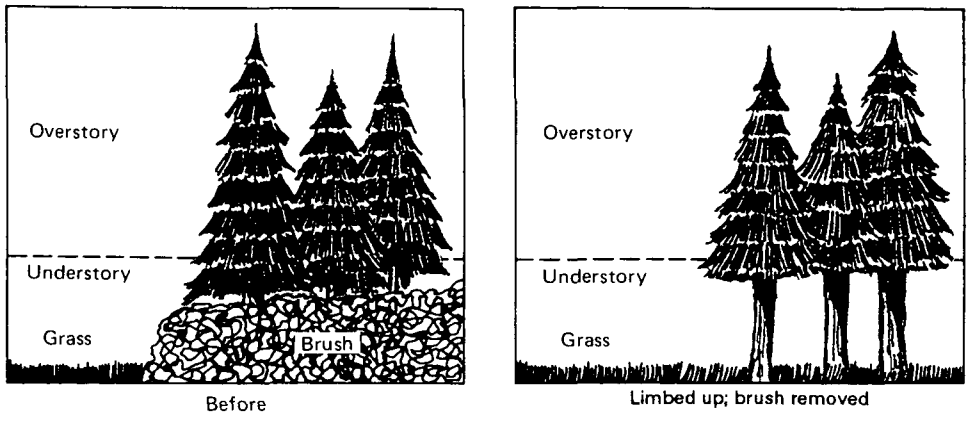

Figure A-3-3(c) Shaded fuel break concept.

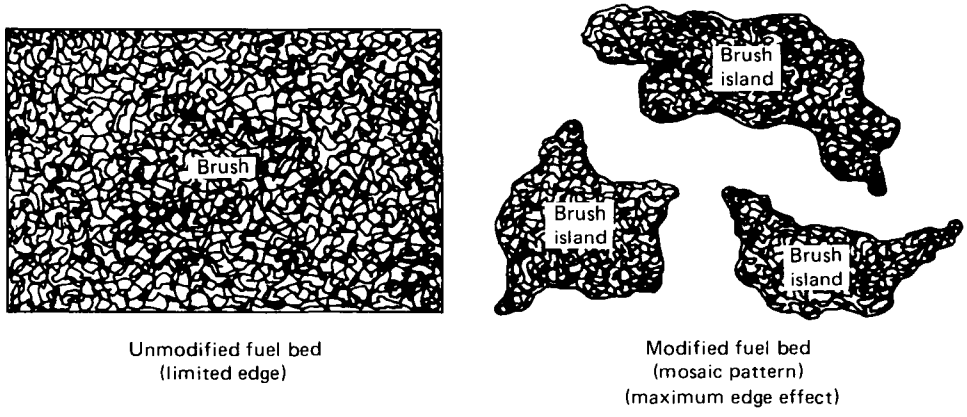

Figure A-3-3(d) Edge effect.

Appendix B Public Firesafety and Fire Prevention Information/Education

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

The following outlines various types of information and education programs and techniques that can be utilized for fire prevention and firesafety information programs.

The choice of programs and techniques will depend on an analysis of the problem, the target audience, and the desired objectives. Generally, programs that include personal contacts are the most effective and should have the highest priority.

I. Exhibits and Displays

A. Exhibits and displays are excellent means of presenting broad interest messages to the general public. As with school programs, a general message or theme should be selected. The story board development process works well with this format.

B. Remember, you must attract your audience to the display, so make it attractive, interesting, and compelling. Use posters, photos, captions, graphics, slide programs, puppets, and skits that involve the viewer. Keep handouts to a minimum, but ensure that they reinforce your message. Have knowledgeable people on hand to answer questions and present your message personally. Consider sharing a space or setting up adjacent to other groups or agencies that present similar themes or messages.

C. Parades provide another opportunity to present a firesafety message, although the presentation should be kept simple and should be able to withstand the stresses of a moving vehicle.

II. Roadside Signs

A. Roadside signs can present a wide variety of fire prevention messages to the general public but should be kept simple and clear to traffic driving by at high speed. Signs 4 ft × 8 ft (1.22 m × 2.44 m) are considered the standard, but signs as small as 4 ft × 4 ft (1.22 m × 1.44 m) can be used effectively.

B. Messages may include "Hazardous Fire Area," "Burning Permits Required," "Spark Arresters Required," or many other traditional messages. The winning poster from a school contest can be painted on the roadside sign to recognize the winner and present a pertinent theme.

C. Obtain written permission from private landowners or prepare agreements with county or state highway departments. Solicit corporate sponsorship for signs and billboards. Keep the signs in good repair and current with the season and message.

III. Group, Youth, and Club Programs

Opportunities to present prevention and safety messages to groups, youths, and clubs should focus on their group activities, specifically their outdoor programs.

IV. Developing and Delivering Presentations

A. General Guidelines: Define your topic for presentation. Outline the points to be covered, based on attention span, knowledge, skill level, and interest. Be sure the presentation focuses on the message you have chosen. Develop the full presentation as outlined. Ask someone else to review your presentation. Rehearse and time your presentation. Remember to speak clearly and with inflection in your voice. Use good posture, keep eye contact, and use your hands for emphasis.

B. Slide-Video-Graphic Presentations: If developed as an independent program, or in conjunction with an existing speech, the program should be complete and complementary. Develop a story board to prepare a complete flow of thoughts and cover all points with appropriate slides or film. Choose the right graphic-visual display to present your points, based on program objective, size of audience, location of audience, and, of course, the budget you have to work with. Use progressive disclosure of information to keep your audience with you and prevent information overload. Keep the story in line with the visuals. Write the script as you develop your visuals. Label and number your slides and graphics.

Rehearse and review your program for smoothness and time. Make sure the right equipment is on hand for your presentation. Consider "canned" programs for use by less technically knowledgeable staff. Graphics must be visible to the person in the farthest corner of the room.

V. Mass Media

Mass media campaigns provide excellent opportunities to disseminate general and specific firesafety messages to a broad spectrum of the public. Progressive or phased campaigns can capitalize on preceding messages or piggyback on recent events. Mass media contacts inform the public and raise their level of awareness and understanding, as well as marketing an agency's image.

A. Developing a Campaign

As with any fire prevention presentation, a central message theme must be identified. Obviously, a professional public relations agency can prove costly and may be prohibitive. Search for assistance from local universities, or corporate donations of airtime, professional assistance, materials, or financial support.

The theme may be broad, allowing many specific areas or messages to be included under that umbrella, whether seasonal or regional in nature.

Developing a goal: The defined goal should consider the target audience, area distribution, level of awareness or information to be received, and the result to be accomplished.

B. Target Audiences

The target audience may be very broad or very narrow, but should be identified and included as compatible with the message theme.

C. Setting Time Frames

Time frames will vary with the type of media used, the seasonal nature of the message presented, and the time lines of the message. The value of your message can be increased through good time management.

D. Getting to Know the Media

To disseminate a firesafety message effectively, you must know and understand the needs and constraints of each type of media outlet.

Newspapers: Local daily and weekly newspapers provide good outlets for detailed stories with readable local angles. Hard news, those stories of immediate interest, such as fire, have short lead times, and information should be provided as soon as possible and as completely as possible. Soft news, those feature stories or campaign messages that have longer lead times, allow publishing during an appropriate time period, such as a holiday or the beginning of fire season. Contact the newspaper to determine who you should talk to, depending upon the type of story.

Television: Again, time frames will depend on the type of news and the individual station format. Feature-type stories should allow for good pictures and action or examples to take advantage of television's visual nature. Talk shows and public affairs programs are excellent vehicles to present a complete story, covering all of the issues. Plan ahead. Lead times to schedule these types of programs should be 6–8 weeks, yet program length can run from 10 min to 1 hr.

Radio: Most radio news stories are limited to 30–60 sec to cover the whole issue. Lead time for program scheduling may exceed 4 weeks. The question-answer format of radio talk shows can allow an in-depth presentation and discussions with the audience. Weekly calendars and public service announcement times can introduce activities, exhibits, and other firesafety programs.

Newsletters: Professional and community newsletters often provide opportunities to present focused messages to target audiences even regionally directed. Lead time and publishing frequency will vary widely.

E. Who to Contact/Visit

Media contacts and telephone numbers change frequently, too. Keep your lists up to date, and stop by to see the reporters periodically.

Print Media: Identify the city desk editor, feature editor, assignment editor, and beat reporters. Find out the lead times and publication dates.

Television: Who are the news director and assignment editor? What types of program formats are available? What are the lead times to schedule?

Radio: Who is the news director? Who is the public affairs director? What is the lead time for program scheduling? What format is best, audio cassette tapes or script, for public service announcements?

F. Preparing News Releases

Probably the most common type of media contact. They provide brief, factual, informative materials to assist an editor in developing a story. The lead paragraph should present a synopsis of the news and include: who, what, when, where, and why. Write in present tense and be concise yet clear. All releases should include the following:

(a) Contact name, title, agency, and phone number
(b) A catchy headline (optional)
(c) Double-spaced text
(d) Two-page maximum text.

Include photographs, preferably 8 in. × 10 in. glossy black and white, with your story, including a caption describing the photograph and identifying all people in the photograph.

G. When to Use a News Advisory

News advisories inform or remind the media about an upcoming event and are most often used to secure broadcast or news coverage of an event. Use the who, what, where, and when scenario when writing the news advisory. Keep it brief and write in the future tense.

Ensure that the news advisory arrives several days before the event. Follow-up your advisory with a phone call reminder just prior to the event.

H. Public Service Announcements (PSAs)

PSAs can be taped on audio cassettes for radio, video cassettes for television, or written in script format for live reads. Like news and feature presentations, PSAs must grab the listener's/viewer's attention and provide clear, concise message delivery. Lengths vary: 15–30 sec for radio, 15–30 sec for television. Take the opportunity to include your agency name and logo in the PSA. PSAs should be mailed or delivered with a cover letter and written transcript a minimum of 4 weeks before you want them to air.

Solicit corporate sponsorship to support the cost of the filming and production. Always follow up with a call to the station to determine when the PSA will air, what time slots, and how many times.

I. Feature Articles

The preparation of a feature-length article or a letter to the editor can allow you to control the story content. Contact the newspaper for specific details about length, format, and publication.

J. Using a Recognized Spokesperson

Benefits of a spokesperson: It is always easier to sell an idea when the person presenting the idea is recognized and respected in the community. The spokesperson may be just someone local or may have regional recognition in many of the households throughout the nation.

This person presents credibility that helps to market your product or service. The spokesperson tends to convey a neutral position, thus not having the bias that an "official" might have.

Appendix C Bibliographical References

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.

In addition to the wildland fire protection analysis described in Chapter 2, a number of other analysis methods have been developed across the country. Each method addresses problems common to a particular section of the country. Each differs in the amount of data required and the complexity of the analysis. To assist the authority having jurisdiction in developing the analysis process that best fits local needs and concerns, a number of references are listed below and may be obtained from the issuing agency.

Aids to Determining Fuel Models for Estimating Fire Behavior, Hal E. Anderson, United States Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report INT-122, Ogden, UT 84401, April 1982.

Fire Hazard Rating: For Existing Wildland Residential Developments or Single Structures in Montana, Montana Department of State Lands, Missoula, MT 59801

Fire Safe Guides for Residential Development in California, California Department of Forestry and Fire Protection, P.O. Box 94244, Sacramento, CA 94244-2460, 1980

Glossary of Wildland Fire Management Terms Used in the United States, Society of American Foresters, 5400 Grosvenor Lane, Washington, DC 20014, 1990

Protecting Residences from Wildfires: A Guide for Homeowners, Lawmakers and Planners, Howard E. Moore, General Technical Report PSW-50, United States Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station, 1960 Addison St., Berkeley, CA 94704

Sierra Front Classification Procedures, Forest Supervisor, Toiyabe National Forest, 1200 Franklin Way, Sparks, NV 89431

Wildland Fire Protection Analysis, Georgia Forestry Commission, Box 819, Macon, GA 31298

Wildland/Urban Interface Fire Protection: A National Problem with Local Solutions, August 1988, National Fire Academy, Federal Emergency Management Agency, Washington, DC

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