NFPA® 150

Standard on Fire and Life Safety in Animal Housing Facilities

2013 Edition

NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471
An International Codes and Standards Organization

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NFPA® 150

Standard on

Fire and Life Safety in Animal Housing Facilities

2013 Edition

This edition of NFPA 150, *Standard on Fire and Life Safety in Animal Housing Facilities*, was prepared by the Technical Committee on Animal Housing Facilities, and acted on by NFPA at its June Association Technical Meeting held June 11–14, 2012, in Las Vegas, NV. It was issued by the Standards Council on August 9, 2012, with an effective date of August 29, 2012, and supersedes all previous editions.

This edition of NFPA 150 was approved as an American National Standard on August 29, 2012.

Origin and Development of NFPA 150

After a series of disastrous fires in racetrack stables in 1975, NFPA established the Committee on Firesafety in Racetrack Stables. This committee began its work in 1976 with the establishment of three working subcommittees covering construction, occupancy requirements, and fire protection. NFPA 150, *Standard on Firesafety in Racetrack Stables*, was first published in 1979. In the 1985 edition, minor changes were made to the standard that included the printing of Table 3 from NFPA 220, *Standard on Types of Building Construction*, in Appendix A. Changes to both the 1991 and 1995 editions consisted of editorial improvements and clarifications of the existing text.

The 2000 edition added a section on equivalency and essentially revised other portions of the text to reflect the *Manual of Style for NFPA Technical Committee Documents* for use of mandatory language.

In 2004, the scope of NFPA 150 expanded to include life and safety requirements for both humans and animals in all types of animal housing facilities. In July of 2004, the Standards Council approved the expansion and changed the name of the document to *Standard on Fire and Life Safety in Animal Housing Facilities*. The expanded NFPA 150 provided better guidance to authorities having jurisdiction by addressing all types of animal housing facilities and made possible the consistent treatment of such facilities from jurisdiction to jurisdiction.

The 2009 edition included several updates related primarily to the referenced codes and standards and to some of the extracted text. A new provision allowing the use of the room-corner test from NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth,* was introduced to allow an alternative test protocol to evaluate interior finish materials.

The 2013 edition includes a new chapter on performance-based design, and requirements for fire protection systems have been revised.

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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: This Committee shall have primary responsibility for documents on the loss of animal and human life and property from fire in animal housing facilities, including, but not limited to the following: barns; stables; kennels; animal shelters; animal hospitals; veterinary facilities; zoos, special amusement parks; agricultural facilities; laboratories; and racetrack stable and kennel areas including those stable and kennel areas, barns, and associated buildings at state, county, and local fairgrounds. This Committee does not cover building code or life safety code requirements that are handled by other committees.

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Standard on

Fire and Life Safety in Animal Housing Facilities

2013 Edition

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

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet (•) between the paragraphs that remain.

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

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

Chapter 1 Administration

1.1 Scope.

1.1.1* This standard shall provide the minimum requirements for the design, construction, fire protection, and classification of animal housing facilities.

1.1.2 Animal housing facilities shall be designed, constructed, and maintained in accordance with the adopted building, fire, and life safety codes and the requirements herein.

1.1.3 Where requirements of this standard differ from the adopted fire prevention, life safety, and building codes, the requirements of this standard shall govern the protection of the animal occupants and animal handlers.

1.2 Purpose. The purpose of this standard shall be to prevent the loss of animal life, human life, and property from fire or other emergencies by providing the minimum requirements for the design, construction, operation, and maintenance of facilities where animals are housed, including but not limited to rest, feed, work, exercise, and production areas.

1.3 Application.

1.3.1* This standard shall apply to animal housing facilities that are subject to local, state, or federal licensing or permitting requirements, including but not limited to the following:

(1) Barns and stables
(2) Kennels
(3) Racetrack stable/kennel areas, including those stable/kennel areas, barns, and associated buildings at state, county, and local fairgrounds
(4) Animal shelters
(5) Animal hospitals and veterinary facilities
(6) Zoos and special amusement parks
(7) Laboratories
(8) Agricultural facilities
(9) Mercantile or business occupancies with animals

1.3.2 This standard shall apply to new animal housing facilities.

1.3.3 This standard shall also apply to existing facilities where any one of the following conditions applies:

(1) A change of use or occupancy classification occurs where animals are introduced.
(2) A change is made in the subclassification or category of the animals housed.
(3) A renovation, modification, reconstruction, or addition is made.
(4) A building or structure with an animal housing facility is relocated.
(5) A building with an animal housing facility is considered damaged, unsafe, or a fire hazard.
(6) A property line that affects compliance with any provision of this standard is created or relocated.

1.3.4* This standard shall apply to temporary structures housing animals solely for the purposes of developing a disaster/emergency management program in accordance with 4.3.4.

1.4 Retroactivity. The provisions of this standard provide an acceptable degree of protection from the hazards addressed in this standard at the time the standard was issued.

1.4.1 Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard. Where specified, the provisions of this standard shall be retroactive.

1.4.2 In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate.

1.4.3 The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, and only where it is clearly evident that a reasonable degree of safety is provided.

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

1.5.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.2 The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.5.3 Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this standard.

1.6 Units.

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

1.6.2 Primary and Equivalent Values. If a value for a measurement as given in this standard is followed by an equivalent value in other units, the first stated value shall be regarded as the requirement. A given equivalent value might be approximate.

1.7 Enforcement. This standard shall be administered and enforced by the authority having jurisdiction designated by the governing authority. *(See Annex B for sample wording for enabling legislation.)*

Chapter 2 Referenced Publications

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

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

NFPA 1, *Fire Code,* 2012 edition.

NFPA 10, *Standard for Portable Fire Extinguishers,* 2010 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2013 edition.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment,* 2011 edition.

NFPA 54/ANSI Z223.1, *National Fuel Gas Code,* 2012 edition.

NFPA 58, *Liquefied Petroleum Gas Code,* 2011 edition.

NFPA 70®, National Electrical Code®, 2011 edition.

NFPA 72®, National Fire Alarm and Signaling Code, 2013 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems,* 2012 edition.

NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems,* 2012 edition.

NFPA 92, *Standard for Smoke Control Systems,* 2012 edition.

NFPA *101®, Life Safety Code®,* 2012 edition.

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances,* 2010 edition.

NFPA 220, *Standard on Types of Building Construction,* 2012 edition.

NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials,* 2006 edition.

NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth,* 2011 edition.

NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment,* 2012 edition.

NFPA 780, *Standard for the Installation of Lightning Protection Systems,* 2011 edition.

NFPA 1144, *Standard for Reducing Structure Ignition Hazards from Wildland Fire,* 2013 edition.

NFPA 1600®, Standard on Disaster/Emergency Management and Business Continuity Programs, 2010 edition.

NFPA 5000®, Building Construction and Safety Code®, 2012 edition.

2.3 Other Publications.

2.3.1 ASCE Publications. American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400.

ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures,* 2010.

2.3.2 ASTM Publications. ASTM International, 100 Bar Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E 84, *Standard Test Method of Surface Burning Characteristics of Building Material,* 2010.

ASTM E 1591, *Standard Guide for Obtaining Data for Deterministic Fire Models,* 2007.

2.3.3 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL 723, *Standard for Test of Surface Burning Characteristics of Building Material,* 2008, with revisions through September 13, 2010.

2.3.4 Other Publications.

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

2.4 References for Extracts in Mandatory Sections.

NFPA 220, *Standard on Types of Building Construction,* 2012 edition.

NFPA 5000®, Building Construction and Safety Code®, 2012 edition.

ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures,* 2010.

Chapter 3 Definitions

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

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

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

3.2.3 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.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of

production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

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

3.2.7 Standard. A document, the main text of which contains only mandatory provisions using the word "shall" to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the *Manual of Style for NFPA Technical Committee Documents*.

3.3 General Definitions.

3.3.1 Addition. An increase in the building area, aggregate floor area, height, or number of stories of a structure. [**ASCE/SEI 7:**11.2]

3.3.2 Animal. For the purposes of this standard, an air-breathing vertebrate.

3.3.2.1* *Confined Animals.* Animals housed such that human intervention is required for their release and evacuation in case of emergency.

3.3.3* Animal Handler. A person responsible for the handling, grooming, and care of confined animals, or reasonably expected to assist in their handling and evacuation in case of emergency.

3.3.4* Animal Housing Facility. Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production.

3.3.5 Building Height. The vertical distance from the grade plane to the average elevation of the highest roof surface. [**5000**, 2012]

3.3.6 Cage. A box or enclosure from which an animal or animals cannot normally escape without human intervention.

3.3.7 Confined Animals. See 3.3.2.1.

3.3.8 Feed Room. See 3.3.20.1.

3.3.9 Fire Resistance Rating. The time, in minutes or hours, that materials or assemblies have withstood a fire exposure as established in accordance with the test procedures of NFPA 251, *Standard Methods of Tests of Tests of Fire Resistance of Building Constuction and Materials*. [**220,** 2012]

3.3.10 General Public. People who do not have an intimate knowledge of the layout of the building or structure, or the general behavior of the animals at the facility, and are not intended personnel.

3.3.11 Halter. A piece of equipment, composed of rope or straps and buckles, that fits securely around the head of an animal such as a horse or cow, used in handling and leading animals from place to place.

3.3.12 Intended Personnel. People working in the animal housing facility with an intimate knowledge of the layout of the building or structure and the general behavior of the animals at the facility, such as employees or students, who are not considered the general public.

3.3.13 Lead. A rope, chain, or strap of suitable length with a clasp at one end used for handling and leading animals by a halter, collar, or harness.

3.3.14 Mechanical Equipment Room. See 3.3.20.2.

3.3.15 Modification. The reconfiguration of any space, the addition or elimination of any door or window, the addition or elimination of load-bearing elements, the reconfiguration or extension of any system, or the installation of any additional equipment. [**5000,** 2012]

3.3.16 Occupancy. The purpose for which a building or other structure, or part thereof, is used or intended to be used. [**ASCE/SEI 7:**1.2]

3.3.17* Protection. A device, material, or system that provides a specified level of safety to achieve a desired outcome.

3.3.18 Reconstruction. The reconfiguration of a space that affects an exit, or a corridor shared by more than a single tenant; or reconfiguration of space such that the rehabilitation work area is not permitted to be occupied because existing means of egress and fire protection systems, or their equivalent, are not in place or continuously maintained. [**5000,** 2012]

3.3.19 Renovation. The replacement in kind, strengthening, or upgrading of elements, materials, equipment, or fixtures that does not result in a reconfiguration of the building or spaces within. [**5000,** 2012]

3.3.20 Room.

3.3.20.1 *Feed Room.* Room used to store feed and feed supplies for animals.

3.3.20.2 *Mechanical Equipment Room.* Room that contains mechanical, electrical, air conditioning, or other equipment.

3.3.20.3 *Storage Room.* Enclosed room within a building containing tack and equipment used for animal handling, capture, restraint, grooming, training, care, and upkeep of the animal facility.

3.3.20.4 *Tack Room.* A storage area for tack and stable equipment.

3.3.21 Stall. A room or compartment that normally houses one or more animals.

3.3.22 Storage Room. See 3.3.20.3.

3.3.23 Tack. Stable gear; also harnesses, bridles, saddles, and other accessories used in riding or driving horses.

3.3.24 Tack Room. See 3.3.20.4.

3.3.25 Trainer. A person responsible for the care and training of animals.

Chapter 4 General Requirements

4.1* Goals and Objectives.

4.1.1* Goals. The primary goals of this standard shall be safety and facility usability for both human and animal occupants, including property protection as it relates to the primary goals.

4.1.2* Objectives. To achieve the goals stated in 4.1.1, the goals and objectives of 4.1.3 and 4.1.4 shall be satisfied.

4.1.3 Safety. The intent of the safety goal of this standard shall be to reduce the probability of injury or death to both animal and human occupants from fire, similar emergencies, and facility use.

4.1.3.1 Safety from Fire.

4.1.3.1.1* Safety-from-Fire Goals. The fire safety goals of this standard shall be as follows:

(1) To provide an environment for human occupants inside an animal housing facility that is reasonably safe from fire and similar emergencies
(2) To provide an environment for animal occupants inside or adjacent to a structure that is reasonably safe from fire and similar emergencies
(3) To provide reasonable safety for fire fighters and emergency responders during search and rescue operations for animal and human occupants
(4) To attempt to minimize loss of property and interruption of facility operations from fire and similar emergencies

4.1.3.1.2 Safety-from-Fire Objectives.

4.1.3.1.2.1 Facilities shall be designed and constructed to protect human and animal occupants not intimate with the initial fire development for the time needed to evacuate, relocate, or defend in place.

4.1.3.1.2.2* Facilities shall be designed and constructed to provide reasonable safety for fire fighters and emergency responders during search and rescue operations for animal and human occupants.

4.1.3.1.2.3 Facilities shall be designed and constructed to provide reasonable access to the structure for emergency responders.

4.1.3.1.2.4 Facilities shall be designed and constructed to reasonably protect adjacent persons, animals, and structures from injury, death, or substantial damage as a result of a fire.

4.1.3.2 Safety During Facility Use.

4.1.3.2.1* Safety-During-Facility-Use Goal. The safety-during-facility-use goal of this standard shall be to provide an environment for both the human and animal occupants of the facility that is reasonably safe during the normal use of the facility.

4.1.3.2.2 Safety-During-Facility-Use Objectives.

4.1.3.2.2.1 Facilities shall be designed and constructed to provide for reasonably safe animal and crowd movement during emergency and nonemergency conditions.

4.1.3.2.2.2 Facilities shall be designed and constructed to provide reasonable safety for animal and human occupants and workers during construction and demolition.

4.1.3.2.2.3* Facilities shall be designed and constructed to provide reasonable and appropriate notification to occupants during emergency situations.

4.1.3.2.2.4 Facilities shall be designed and constructed to provide reasonable signage to identify hazards, means of egress, and other building safety features.

4.1.4 Usability Goal. The intent of the usability goal of this standard shall be to ensure that the facility is capable of functioning at the level for which it was designed.

4.1.4.1 Function.

4.1.4.1.1* Function Goal. The intent of the function goal of this standard shall be to ensure that a facility and its systems, features, and construction, throughout its life, provide reasonable capability of operation to satisfy the other goals of this standard.

4.1.4.1.2* Function Objective. Facilities shall be designed and constructed to provide reasonable assurance that its systems, features, and construction are capable of performing their intended use to satisfy the objectives of this standard.

4.2 Fundamental Fire and Life Safety Requirements.

4.2.1 Multiple Safeguards.

4.2.1.1 The design of every facility intended for animal and human occupancy shall be such that reliance for property protection and safety to life does not depend solely on any single safeguard.

4.2.1.2 Additional safeguard(s) shall be provided for property protection and life safety in case any single safeguard is ineffective due to inappropriate animal or human actions, building failure, or system failure.

4.2.2 Appropriateness of Safeguards. Every facility shall be provided with means of egress and other fire and life safety safeguards of the kinds, numbers, locations, and capacities appropriate to the individual facility, with due regard to the following:

(1) Character of the occupancy, including fire load
(2) Capabilities of both the human and animal occupants
(3) Number of animals and persons exposed
(4) Fire protection available
(5) Height and type of construction of the facility
(6) Other factors necessary to provide animal and human occupants with a reasonable degree of safety
(7) Other factors necessary to protect the facility and contents from unacceptable damage

4.2.3 Means of Egress. The minimum number of means of egress for human and animal occupants shall be in accordance with Chapter 8.

4.2.4* Occupant Notification. In every facility of such size, arrangement, or occupancy that a fire itself might not provide adequate occupant warning, fire alarm systems shall be provided where necessary to warn occupants of the existence of fire.

4.2.5 System Design and Installation. Any fire protection system, building service equipment, feature of protection, or safeguard provided for fire and life safety shall be designed, installed, and approved in accordance with applicable NFPA codes and standards.

4.2.6 Limiting Fire Spread.

4.2.6.1 The interior surfaces of the facility shall not contribute to an unacceptable rate and magnitude of fire spread and generation of heat and smoke.

4.2.6.2 The construction of concealed spaces shall not contribute to an unacceptable rate of the spread of fire, hot gases, and smoke to areas of the facility remote from the fire source and shall limit their spread beyond the immediate area of the origin of the fire.

4.2.6.3 The facility shall be compartmented, as appropriate, by walls and floors, including their associated openings with

proper closures, to limit the spread of fire, hot gases, and smoke to an acceptable area beyond the immediate area of fire origin.

4.2.7 Structural Integrity. The facility's structural members and assemblies shall be provided with the required degree of fire resistance to limit structural damage, damage to the building and its contents, and damage to adjacent buildings and property.

4.3 General Requirements.

4.3.1 Authority Having Jurisdiction.

4.3.1.1 The authority having jurisdiction (AHJ) shall determine whether the provisions of this standard are met.

4.3.1.2 Where it is evident that a reasonable degree of safety is provided, any requirement shall be permitted to be modified if its application would be hazardous under normal occupancy conditions in the judgment of the AHJ.

4.3.1.3* Where it is evident that special circumstances not specifically addressed in this standard exist in the design, construction, use, or operation of the facility, the AHJ shall be permitted to require additional safeguards such that a reasonable degree of safety is provided.

4.3.2 Provisions in Excess of Standard Requirements. Nothing in this standard shall be construed to prohibit a superior type of building construction, an additional means of egress, or an otherwise safer condition than that specified by the minimum requirements of this standard.

4.3.3 Maintenance and Testing.

4.3.3.1 Where any device, equipment, system, condition, arrangement, or level of protection, or any other feature, is required for compliance with the provisions of this standard, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with applicable NFPA requirements or as directed by the AHJ.

4.3.3.2 Equipment requiring periodic testing or operation to ensure its maintenance shall be tested or operated as specified elsewhere in this standard or as directed by the AHJ.

4.3.3.3 Maintenance and testing shall be under the supervision of a responsible person who shall ensure that testing and maintenance are made at specified intervals in accordance with applicable NFPA standards or as directed by the AHJ.

4.3.4 Disaster/Emergency Management Program.

4.3.4.1 General. Disaster/emergency management programs shall be required in all animal housing facilities to protect and ensure the safety of the animal and human occupants during fire or other similar emergencies.

4.3.4.2 Program Requirements.

4.3.4.2.1* Disaster/emergency management programs shall be developed in accordance with *NFPA 1600*, *Standard on Disaster/Emergency Management and Business Continuity Programs*, and shall include the procedures for reporting emergencies; the occupant and staff response to emergencies; the design and conduct of disaster/emergency drills; the type and coverage of building fire protection systems; and other items required by the AHJ.

4.3.4.2.2 Required disaster/emergency management programs shall be submitted to the AHJ for review and approval.

4.3.4.2.3 Disaster/emergency management programs shall be reviewed and updated annually.

4.3.4.2.4 Revised plans shall be submitted for review and updates shall be provided whenever changes are made in the occupancy or physical arrangement of the building or fire protection systems or features.

4.3.4.2.5 Floor plans shall be provided to the AHJ, as requested.

4.3.4.2.6 In accordance with the disaster/emergency management program, equipment designated as necessary for the evacuation of animals, such as halters and leads, shall be worn by or kept near each animal at all times.

4.3.5* Disaster/Emergency Drills.

4.3.5.1 Disaster/emergency drills conforming to the provisions of this standard shall be conducted in cooperation with the local authorities and as specified by this standard or by the AHJ.

4.3.5.2 Drill Frequency.

4.3.5.2.1 Where required by this standard or the AHJ, disaster/emergency drills shall be held to familiarize occupants with the drill procedure and to establish conduct of the drill as a matter of routine.

4.3.5.2.2* Disaster/emergency drills shall include procedures to ensure that all persons subject to the drill participate.

Chapter 5 Performance-Based Design Option

5.1* General Requirements.

5.1.1 Application. The requirements of this chapter shall apply to buildings or structures, portions of buildings or structures, or building systems designed in accordance with the performance-based option permitted by Section 4.3.

5.1.2 Goals and Objectives. The performance-based design shall meet the goals and objectives of Section 4.1.

5.1.3* Independent Review. The authority having jurisdiction shall be permitted to require an approved, independent third party to review the proposed design and provide an evaluation of the design to the authority having jurisdiction at the expense of the owner.

5.1.4 Sources of Data. Data sources shall be identified and documented for each input data requirement that must be met using a source other than a design scenario, an assumption, or a building design specification. The degree of conservatism reflected in such data shall be specified, and a justification for the source shall be provided.

5.1.5* Final Determination. The authority having jurisdiction shall make the final determination as to whether the performance objectives have been met.

5.1.6* Maintenance of Design Features.

5.1.6.1 The design features required for the building to continue to meet the performance goals and objectives of this standard shall be maintained for the life of the building. Such performance goals and objectives shall include complying with all documented assumptions and design specifications. Any variations shall require the approval of the authority having jurisdiction prior to the actual change.

5.1.6.2 Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or other feature is required to meet the goals, objectives, or performance criteria of this standard, approved procedures for the operation and maintenance of such device, equipment, system, condition, arrangement, level of protection, or other feature shall be prepared, and an approved system of inspection, maintenance, and testing shall be included in an operations and maintenance manual developed as part of the performance-based design.

5.1.7 Special Definitions. See Section 3.3.

5.2 Safety-from-Fire Goals.

5.2.1 The fire safety goals of this standard shall be as follows:

(1) To provide an environment for human occupants inside an animal housing facility that is reasonably safe from fire and similar emergencies
(2) To provide an environment for animal occupants inside or adjacent to a structure that is reasonably safe from fire and similar emergencies
(3) To provide reasonable safety for fire fighters and emergency responders during search and rescue operations for animal and human occupants
(4) To attempt to minimize loss of property and interruption of facility operations from fire and similar emergencies

5.2.2 Safety-from-Fire Objectives.

5.2.2.1 Facilities shall be designed and constructed to protect human and animal occupants not intimate with the initial fire development for the time needed to evacuate, relocate, or defend in place.

5.2.2.2* Facilities shall be designed and constructed to provide reasonable safety for fire fighters and emergency responders during search and rescue operations for animal and human occupants.

5.2.2.3 Facilities shall be designed and constructed to provide reasonable access to the structure for emergency responders.

5.2.2.4 Facilities shall be designed and constructed to reasonably protect adjacent persons, animals, and structures from injury, death, or substantial damage as a result of a fire.

5.2.3 Safety During Facility Use.

5.2.3.1* Safety-During-Facility-Use Goal. The safety-during-facility-use goal of this standard shall be to provide an environment for both the human and animal occupants of the facility that is reasonably safe during the normal use of the facility.

5.2.3.2 Safety-During-Facility-Use Objectives.

5.2.3.2.1 Facilities shall be designed and constructed to provide for reasonably safe animal and crowd movement during emergency and nonemergency conditions.

5.2.3.2.2 Facilities shall be designed and constructed to provide reasonable safety for animal and human occupants and workers during construction and demolition.

5.2.3.2.3* Facilities shall be designed and constructed to provide reasonable and appropriate notification to occupants during emergency situations.

5.2.3.2.4 Facilities shall be designed and constructed to provide reasonable signage to identify hazards, means of egress, and other building safety features.

5.2.3.3 Glass or other similar frangible construction material shall be installed in such a manner that, if occupants come into contact with such material, one of the following occurs:

(1) The material resists impact without breaking.
(2) The material breaks in such a manner that it does not cause injury.
(3) The material is protected from occupant impact.

5.2.4 Uncontrolled Moisture.

5.2.4.1 Where critical to the operation and use of the animal housing facility, uncontrolled moisture shall be controlled in accordance with 5.2.4.1.1 through 5.2.4.1.3.

5.2.4.1.1 The exterior envelope of the building shall be designed to control the entry of precipitation into the building.

5.2.4.1.2 The exterior walls, attics, crawl spaces, and other concealed or enclosed building elements that constitute the building envelope shall be designed to control the accumulation of water vapor or its condensation in such quantities and physical state that contact of water vapor or its condensation with the building insulation or building materials will not result in conditions that adversely affect the health of the building occupants.

5.2.4.1.3 Building materials located in areas within the building that are subject to exposure from water discharges or leaks in quantities and durations that cause exterior moisture to accumulate for extended periods of time, thus resulting in conditions that adversely affect the health of the building occupants, shall be designed to control penetration of, or direct contact with, water or shall be protected from such exposure.

5.3 Retained Prescriptive Requirements. The design shall comply with the requirements of Section 5.3 in addition to the performance criteria of Section 5.2 and the methods of Sections 5.4 through 5.8.

5.3.1 Systems and Features. All fire protection systems and features of the building shall comply with applicable NFPA standards for those systems and features.

5.3.2 Means of Egress. Means of egress shall comply with Chapter 8.

5.4* Performance-Based Design Characteristics and Assumptions.

5.4.1 General.

5.4.1.1 Design characteristics and assumptions used in the performance-based design shall be clearly stated and shown to be realistic and sustainable.

5.4.1.2 Each design characteristic and assumption used in the design shall be accurately translated into input data specifications, as appropriate for the calculation method or model to be used.

5.4.1.3 Design characteristics and assumptions that the design analyses do not explicitly address or incorporate and that are, therefore, omitted from input data specifications shall be identified, and a sensitivity analysis of the consequences of that omission shall be performed.

5.4.1.4 Design characteristics and assumptions modified in input data specifications, due to limitations in test methods or other data-generation procedures, shall be identified, and a sensitivity analysis of the consequences of the modification shall be performed.

5.4.1.5* The design shall not include mutually inconsistent characteristics, assumptions, or statements of conditions.

5.4.2 Building Characteristics and Assumptions.

5.4.2.1* Characteristics of the building or its contents, equipment, layout, or operations that are not inherent in the design specifications, but that affect occupant or building behavior or the rate of hazard development, shall be explicitly identified.

5.4.2.2* The performance of building systems and features shall reflect the documented performance and reliability of the components of those systems or features, unless design specifications are incorporated to modify the expected performance.

5.4.3 Occupant Characteristics and Assumptions.

5.4.3.1* General. The selection of occupant characteristics to be used in the design calculations shall be approved by the authority having jurisdiction and shall provide an accurate reflection of the expected population of building users.

5.4.3.2 Occupant Profile. Occupant characteristics shall represent the normal occupant profile, unless design specifications are used to modify the expected occupant features.

5.4.3.3 Response Characteristics. The basic response characteristics of sensibility, reactivity, mobility, and susceptibility shall be considered. Such consideration shall include the expected distribution of characteristics of a population appropriate to the use of the building. The source of data for these characteristics shall be documented.

5.4.3.4 Location. It shall be assumed that, in every normally occupied room or area, at least one occupant shall be located at the most remote point from the exits.

5.4.3.5* Number of Occupants. The design shall be based on the maximum number of occupants that every occupied room or area is expected to contain. Where success or failure of the design is contingent on a specified maximum number of occupants, operational controls shall be used to ensure that a greater number of occupants could not be expected to be present.

5.4.3.6* Staff Assistance. In those occupancies where staff assistance is required to ensure the safety of other occupants, such trained assistance shall be provided. The ability of trained employees to be included as part of the building safety system shall be identified and documented.

5.4.4 Emergency Response Personnel Characteristics and Assumptions.

5.4.4.1 Nongovernmental emergency response personnel shall not be relied upon in the performance design, unless they are under the continuous and direct control of the building owner or occupant. Emergency response personnel of the governmental agency legally responsible for providing emergency responders to the local jurisdiction shall be permitted to be relied upon in the performance design when approved by the governmental agency.

5.4.4.2 Design characteristics and assumptions related to the availability, speed of response, effectiveness, roles, and other characteristics of emergency response personnel shall be specified, estimated, or characterized sufficiently for evaluation of the design.

5.5* Design Scenarios.

5.5.1 General.

5.5.1.1 The proposed design shall be considered to meet the goals and objectives if it achieves the performance criteria for each required design scenario. The authority having jurisdiction shall approve the parameters involved with design scenarios.

5.5.1.2 Design scenarios shall be evaluated for each required scenario using a method acceptable to the authority having jurisdiction and appropriate for the conditions. Each scenario shall be as challenging and realistic as any that could realistically occur in the building.

5.6 Evaluation of Proposed Designs.

5.6.1 General. A proposed design's performance shall be assessed relative to each performance objective in Section 4.1 and each applicable scenario in Section 5.5, with the assessment conducted through the use of appropriate calculation methods. The authority having jurisdiction shall approve the choice of assessment methods.

5.6.2 Use. The design professional shall use the assessment methods to demonstrate that the proposed design will achieve the goals and objectives for each scenario, as measured by the performance criteria in light of the safety margins and uncertainty analysis, given the assumptions.

5.6.3 Input Data.

5.6.3.1 Data. Input data for computer fire models shall be obtained in accordance with ASTM E 1591, *Standard Guide for Obtaining Data for Deterministic Fire Models.* Data for use in analytical models that are not computer-based fire models shall be obtained using appropriate measurement, recording, and storage techniques to ensure the applicability of the data to the analytical method being used.

5.6.3.2 Data Requirements. A complete listing of input data requirements for all models, engineering methods, and other calculation or verification methods required or proposed as part of the performance-based design shall be provided.

5.6.3.3 Uncertainty and Conservatism of Data. Uncertainty in input data shall be analyzed and, as determined appropriate by the authority having jurisdiction, addressed through the use of conservative values.

5.6.4 Output Data. The assessment methods used shall accurately and appropriately produce the required output data from input data based on the design specifications, assumptions, and scenarios.

5.6.5 Validity. Evidence shall be provided confirming that the assessment methods are valid and appropriate for the proposed building, use, and conditions.

5.7 Safety Factors. Approved safety factors shall be included in the design methods and calculations to reflect uncertainty in the assumptions, data, and other factors associated with the performance-based design.

5.8 Documentation Requirements.

5.8.1* General. All aspects of the design, including those described in 5.8.2 through 5.8.14, shall be documented. The format and content of the documentation shall be acceptable to the authority having jurisdiction.

5.8.2 Technical References and Resources. The authority having jurisdiction shall be provided with sufficient documentation to support the validity, accuracy, relevance, and precision of the proposed methods. The engineering standards, calculation methods, and other forms of scientific information provided shall be appropriate for the particular application and methodologies used.

5.8.3 Building Design Specifications. All details of the proposed building design that affect the ability of the building to meet the stated goals and objectives shall be documented.

5.8.4 Performance Criteria. Performance criteria, with sources, shall be documented.

5.8.5 Occupant Characteristics. Assumptions about occupant characteristics shall be documented.

5.8.6 Design Scenarios. Descriptions of design hazards scenarios shall be documented.

5.8.7 Input Data. Input data to models and assessment methods, including sensitivity analysis, shall be documented.

5.8.8 Output Data. Output data from models and assessment methods, including sensitivity analysis, shall be documented.

5.8.9 Safety Factors. The safety factors utilized shall be documented.

5.8.10 Prescriptive Requirements. Retained prescriptive requirements shall be documented.

5.8.11* Modeling Feature.

5.8.11.1 Assumptions made by the model user and the description of the models and methods used, including known limitations, shall be documented.

5.8.11.2 Documentation shall be provided verifying that the assessment methods have been used validly and appropriately to address the design specifications, assumptions, and scenarios.

5.8.12 Evidence of Modeler Capability. The design team's relevant experience with the models, test methods, databases, and other assessment methods used in the performance-based design proposal shall be documented.

5.8.13 Performance Evaluation. The performance evaluation summary shall be documented.

5.8.14 Use of Performance-Based Design Option. Design proposals shall include documentation that provides anyone involved in ownership or management of the building with notification of the following:

(1) The building was approved as a performance-based design with certain specified design criteria and assumptions.
(2) Any remodeling, modification, renovation, change in use, or change in the established assumptions is to be reevaluated and reapproved.

Chapter 6 Subclassification of Animal Housing Facilities and Categorization of Animals

6.1 General.

6.1.1* Occupancy Classification. The general occupancy classification of a facility housing animals shall be determined in accordance with *NFPA 5000, Building Construction and Safety Code*, Chapter 6, or NFPA *101, Life Safety Code*, Chapter 6.

6.1.2 Occupancy Separations. The separations required between different occupancies shall be in accordance with *NFPA 5000, Building Construction and Safety Code*, Chapter 6, or NFPA *101, Life Safety Code*, Chapter 6.

6.2 Animal Housing Facility Subclassifications.

6.2.1 The occupancy of a facility housing animals shall be subclassified in accordance with this section.

6.2.1.1* Class 1 Facility. A Class 1 facility shall be an area of a building housing animals with no general public access.

6.2.1.2* Class 2 Facility. A Class 2 facility shall be an area of a building housing animals with restricted general public access.

6.2.1.3* Class 3 Facility. A Class 3 facility shall be an area of a building housing animals with regular general public access.

6.2.2 Animal housing facility subclassifications shall be subject to the ruling of the AHJ where there is a question of classification.

6.2.3 Types of Subclassifications.

6.2.3.1 Multiple Subclassification. A multiple subclassification facility shall be a facility in which two or more subclasses of animal housing facilities exist.

6.2.3.2 Mixed Subclassification. A mixed subclassification facility shall be a multiple subclassification facility where the subclassifications are intermingled.

6.2.3.3 Separated Subclassification. A separated subclassification facility shall be a multiple subclassification facility where the subclassifications are separated by fire barriers in accordance with NFPA *101, Life Safety Code*, or *NFPA 5000, Building Construction and Safety Code*, rated assemblies.

6.2.4 Multiple Subclassification.

6.2.4.1* Multiple subclassifications *(see 6.2.3)* shall comply with the requirements of one of the following:

(1) Mixed subclassification requirements *(see 6.2.5)*
(2) Separated subclassification requirements *(see 6.2.6)*

6.2.4.2* Where minor accessory subclassifications do not occupy more than 25 percent of the area of any story of a facility, the principal use of the facility shall determine the subclassification.

6.2.5 Mixed Subclassification.

6.2.5.1 Each portion of the facility shall be subclassified as to its use in accordance with 6.2.1.

6.2.5.2 The means of egress, type of construction, protection, and other safeguards in the facility shall comply with the most restrictive fire and life safety requirements of the subclassifications involved.

6.2.6 Separated Subclassification.

6.2.6.1 Where separated subclassifications are provided, each part of the structure comprising a distinct subclassification, as described in this chapter, shall be completely separated from other subclassifications by fire-resistive assemblies in accordance with NFPA *101, Life Safety Code*, or *NFPA 5000, Building Construction and Safety Code*, as specified in 6.2.6 and Table 6.2.6.1, unless separation is provided by approved existing separations.

6.2.6.1.1 Subclassification separations shall be classified as 2-hour fire resistance rated or 1-hour fire resistance rated, and shall meet the requirements of *NFPA 5000, Building Construction and Safety Code*, Chapter 8, or NFPA *101, Life Safety Code*, Chapter 8.

6.2.6.1.2 The fire resistance rating specified in Table 6.2.6.1 shall be permitted to be reduced by 1 hour, but in no case shall it be reduced to less than 1 hour, where the facility is protected

Table 6.2.6.1 Required Fire Resistance–Rated Separation for Subclassification in Hours

	Class 1 Facility	Class 2 Facility	Class 3 Facility
Class 1 Facility	—	1	2
Class 2 Facility	1	—	1
Class 3 Facility	2	1	—

Note: See 6.2.6.1.2 for fire-resistance rating reductions.

throughout by an approved automatic sprinkler system in accordance with Section 9.2.

6.2.6.2 Subclassification separations shall be vertical, horizontal, or both, or, when necessary, of such other form as required to provide complete separation between subclassification divisions in the structure.

6.2.6.3 Where the subclassification separation is horizontal, structural members supporting the separation shall be protected by an equivalent fire-resistive construction.

6.2.7 If there is a change in subclassification, the facility shall meet the requirements for the new subclassification.

6.3 Categorization of Animals.

6.3.1 Animal Type. The type of animal shall be categorized in each area of the animal housing facility in accordance with 6.3.1.1 and 6.3.1.2.

6.3.1.1 Category A. Category A animals shall include any of the following types of animals:

(1)*Animal(s) that pose a potential risk to the health or safety of rescuers or the general public
(2)*Animal(s) that cannot be removed without potential risk to the health and welfare of the animal or other animals
(3)*Animal(s) that are impossible or impractical to move
(4)*Animal(s) that are not mobile or not in a mobile enclosure

6.3.1.2 Category B. Category B animals shall include all animals not in Category A, as specified in 6.3.1.1.

6.3.2 Question of Categorization. Animal categories shall be subject to the ruling of the AHJ where there is a question of categorization.

6.3.3 Change in Animal Category. If the category of animal in an animal housing facility changes, the facility shall meet the requirements for the new animal category.

Chapter 7 Construction and Separation Requirements

7.1* Types of Construction. The types of construction for animal housing facilities shall be in accordance with NFPA 220, *Standard on Types of Building Construction*, or *NFPA 5000, Building Construction and Safety Code*, Section 7.2.

7.2 Height and Area Requirements.

7.2.1 General. The height and area requirements for the occupancy of the animal housing facility shall be in accordance with *NFPA 5000, Building Construction and Safety Code*, Section 7.4.

7.2.1.1 Exterior areas such as corrals, paddocks, or other fenced holding areas attached to animal housing facilities shall not be included in the calculated allowable area per story.

7.2.1.2 If such exterior areas are partially or totally covered by extended roof structures integral with the building, the line of primary structure supporting such roofed areas shall be considered exterior wall lines when determining location on property.

7.2.2* Additional Requirements. In addition to the requirements of 7.2.1, the allowable number of stories above grade where the animal housing facilities are permitted and the allowable area per story of animal housing facilities shall not exceed the limits set forth in Table 7.2.2. The values in Table 7.2.2 for sprinklered facilities shall apply to facilities protected throughout with an approved, electrically supervised automatic sprinkler system in accordance with Section 9.2.

7.2.3 Maximum Facility Area. The maximum area of the animal housing facilities within a building or structure shall be determined by multiplying the allowable area per story, as determined by Table 7.2.2, by the facility's number of stories up to a maximum of three stories.

7.2.4 Multiple Subclassifications. Where an animal housing facility is occupied by animals of two or more subclassifications, the animal housing facility shall comply with this section.

7.2.4.1 Mixed Subclassifications. Animal housing facilities with mixed subclassifications complying with 6.2.5 shall have their required type of construction determined by applying the most restrictive type of construction to the entire animal housing facility.

7.2.4.2 Separated Subclassifications. Animal housing facilities with separated occupancies complying with 6.2.6 shall have their required type of construction determined in accordance with 7.2.4.2.1 and 7.2.4.2.2.

7.2.4.2.1 The location of each separated subclassification in the animal housing facility shall comply with the story requirements of 7.2.2.

7.2.4.2.2 For each story in the animal housing facility, the sum of the ratios of the per story area of each separated subclassification divided by the allowable area per story as determined by Table 7.2.2 shall not exceed 1.0.

7.3* Stall, Cage, and Enclosure Requirements.

7.3.1 Stalls, cages, and enclosures housing one or more animals shall allow space for each animal to express all species-typical postures, social adjustment, behaviors, and movements.

7.3.2 Animals shall be able to lie down with limbs extended in a normal manner without obstruction from enclosure sides or having to extend feet through feeder doors or bars.

7.3.3 Modifications to 7.3.1 and 7.3.2 shall be permitted for temporary (i.e., less than 12 hours) holding areas with the approval of the AHJ.

7.4 Exposure Protection. Adjacent buildings shall be separated in accordance with *NFPA 5000, Building Construction and Safety Code*, Chapter 7.

7.5 Structural Design.

7.5.1 Structural design shall be subject to the requirements of *NFPA 5000, Building Construction and Safety Code*, Chapter 35, and this section.

Table 7.2.2 Allowable Facility Height and Areas

Construction Type		I (442)		I (332)		II (222)		II (111)		II (000)		III (211)		III (200)		IV		V (111)		V (000)	
Sprinklered or Nonsprinklered		S	N	S	N	S	N	S	N	S	N	S	N	S	N	S	N	S	N	S	N
Class 1 Facilities																					
Category A Animals	Stories	UL	NP	UL	NP	12	NP	6	NP	4	NP	6	NP	4	NP	6	NP	4	NP	3	NP
	Area (1000 ft^2)	UL	NP	UL	NP	UL	NP	75	NP	46	NP	57	NP	38	NP	72	NP	36	NP	18	NP
Category B Animals	Stories	UL	UL	UL	UL	12	11	6	5	4	3	6	5	4	3	6	5	4	3	3	2
	Area (1000 ft^2)	UL	90	UL	90	UL	90	75	37.5	46	23	57	28.5	38	19	72	36	36	18	18	9
Class 2 Facilities																					
Category A Animals	Stories	UL	NP	UL	NP	12	NP	5	NP	3	NP	5	NP	3	NP	5	NP	4	NP	2	NP
	Area (1000 ft^2)	UL	NP	UL	NP	UL	NP	43	NP	25	NP	37	NP	25	NP	41	NP	28	NP	18	NP
Category B Animals	Stories	UL	UL	UL	UL	12	11	5	4	3	2	5	4	3	2	5	4	4	3	2	2
	Area (1000 ft^2)	UL	45	UL	45	UL	45	43	21.5	25	12.5	37	18.5	25	12.5	41	20.5	28	14	18	9
Class 3 Facilities																					
Category A Animals	Stories	UL	NP	UL	NP	12	NP	4	NP	3	NP	4	NP	3	NP	4	NP	3	NP	2	NP
	Area (1000 ft^2)	UL	NP	UL	NP	UL	NP	31	NP	19	NP	28	NP	19	NP	30	NP	23	NP	12	NP
Category B Animals	Stories	UL	UL	UL	UL	12	11	4	3	3	2	4	3	3	2	4	3	3	2	2	1
	Area (1000 ft^2)	UL	45	UL	45	UL	45	31	15.5	19	9.5	28	14	19	9.5	30	15	23	11.5	12	6

For SI units, 1 ft = 0.3048 m, 1 ft^2 = 0.093 m^2.

S: Sprinklered. Allowable facility height in feet and allowable number of stories above grade in facilities protected with an automatic sprinkler system as specified in 7.2.2.

N: Nonsprinklered. Allowable facility height in feet and allowable number of stories above grade in facilities not protected with an automatic sprinkler system as specified in 7.2.2.

UL: Unlimited.

NP: Not permitted.

Note: Within each subclassification, "Stories" refers to the allowable number of stories above grade where the animal housing facilities are permitted to be located; "Area" refers to the allowable area per story.

7.5.2* Structural design criteria for walls and fence assemblies providing animal containment shall be designed to withstand the horizontal forces exerted by the animal occupants.

7.6 Fire-Rated Separations Between Animal Housing Facilities and Hazardous Areas.

7.6.1 Animal housing facilities shall be separated with a 2-hour fire resistance-rated enclosure from hazardous areas, including, but not limited to, feed rooms, tack rooms, vehicle or equipment storage rooms, blacksmith shops, kitchens, mechanical equipment rooms, and similar areas.

7.6.2 In buildings protected throughout with an approved, supervised automatic sprinkler system in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*, animal housing facilities shall be permitted to be separated with a 1-hour fire resistance-rated enclosure from the hazardous areas identified in 7.6.1.

7.7 Wildland/Urban Interface or Wildland/Urban Intermix. Animal housing facilities located in a wildland/urban interface or wildland/urban intermix shall comply with this standard and the construction requirements of NFPA 1144, *Standard for Reducing Structure Ignition Hazards from Wildland Fire.*

Chapter 8 Means of Egress Requirements

8.1 General. Means of egress for Category A and Category B animals shall be in accordance with this chapter.

8.1.1* Category A. Category A animals that can be safely egressed to a holding area, without human contact, shall have adequate means of egress provided.

8.1.2 Category B. Category B animals, which will egress with an animal handler, shall have means of egress that comply with NFPA *101*, *Life Safety Code*, or *NFPA 5000*, *Building Construction and Safety Code*, and 8.1.2.1 through 8.1.2.4.

8.1.2.1 Number of Means of Egress.

8.1.2.1.1 Two means of egress for human and animal occupants, as a minimum, shall be provided in every facility, section, and area where size, occupancy, and arrangement endanger occupants attempting to use a single means of egress that is blocked by fire or smoke.

8.1.2.1.2 Where two means of egress are required, they shall be arranged to minimize the possibility that both might be rendered impassable by the same emergency condition.

8.1.2.2 Minimum Width of Doors. The minimum width of the door openings in means of egress shall be the greater of the following:

(1) Clear width of 32 in. (815 mm)
(2)*One-and-one-half times the largest average width of the following:
   (a) Largest animal using the door
   (b) Any associated equipment necessary for egress

8.1.2.3 Minimum Height of Doors. The minimum height of the door openings in means of egress shall accommodate the animal, human, and any associated equipment.

8.1.2.4* Exit Travel Distances.

8.1.2.4.1 In animal housing facilities not sprinklered in accordance with Section 9.2, exit travel distance shall not exceed 75 ft (23 m) from any point in the facility.

8.1.2.4.2 In animal housing facilities sprinklered in accordance with Section 9.2, exit travel distance shall not exceed 100 ft (30 m) from any point in the facility.

8.2* Animal Occupant Load. Animal occupant load shall be determined based upon approved industry standards specific to the size of the animal and the stall, cage, and enclosure configurations.

Chapter 9 Requirements for Protection from Fire and Special Hazards

9.1 General.

9.1.1 Requirements for protection from fire and special hazards shall be in accordance with NFPA 1, *Fire Code*; NFPA *101*, *Life Safety Code*; or *NFPA 5000*, *Building Construction and Safety Code*; and this chapter.

9.1.2 Where a change in subclassification occurs and the installed fire protection systems are no longer necessary or no longer required, the facility owner shall either maintain the systems in full operation or completely remove them.

9.2 Sprinkler Protection.

9.2.1 Where automatic sprinklers are required by this standard throughout the animal housing facility, the system shall be installed in accordance with the requirements of Section 9.2 and the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems*.

9.2.2 Occupancy and commodity classifications shall be in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

9.2.3 Quick-response sprinklers shall be utilized in animal housing facilities.

9.2.4 Automatic sprinkler systems shall be arranged to transmit the alarm automatically via any of the following means acceptable to the authority having jurisdiction and shall be in accordance with *NFPA 72*, *National Fire Alarm and Signaling Code*:

(1) Auxiliary fire alarm system
(2) Central station fire alarm system
(3) Proprietary supervision station fire alarm system
(4) Remote supervising station fire alarm system

9.2.4.1 Where a fire alarm system is not required by another section of this standard, automatic sprinkler system monitoring shall be in accordance with 23.8.5.5 of *NFPA 72*, *National Fire Alarm and Signaling Code*.

9.2.4.2 A single manual pull station shall be provided in accordance with 23.8.5.1 of *NFPA 72*, *National Fire Alarm and Signaling Code* at a location approved by the authority having jurisdiction.

9.3 Fire Alarm Systems.

9.3.1 Where fire alarm systems are required by this standard throughout the animal housing facility, alarm systems shall be in accordance with *NFPA 72*, *National Fire Alarm and Signaling Code*, and the requirements of this section.

9.3.2 The alarm system shall sound an audible and visual exterior alarm for purposes of initiating emergency action.

9.3.2.1* Modifications to 9.3.2 shall be permitted to accommodate the needs of the animal occupants, with approval of the AHJ.

9.3.3 Where fire alarm graphic annunciator panels are provided, they shall identify animal areas within the building.

9.3.4 Where the locations of animal facilities are sensitive, the specific locations of animal housing will be provided to the fire department but will not be subject to the graphic annunciator panel requirement in 9.3.3.

9.4 Fire Extinguishers.

9.4.1 Where fire extinguishers are required by this standard throughout the animal housing facility, fire extinguishers shall be provided in accordance with NFPA 10, *Standard for Portable Fire Extinguishers*.

9.4.2 Extinguishers in accordance with 9.4.1 shall have a minimum 2-A:10-B:C rating and shall be not more than a 50 ft (15.2 m) travel distance from any point within the animal housing facility.

9.4.3 Placement of the fire extinguishers shall be determined by the AHJ so as to prevent injury to or damage by the animal occupants.

9.5 Lightning Protection. Where lightning protection is required by this standard for the animal housing facility, lightning protection shall be in accordance with NFPA 780, *Standard for the Installation of Lightning Protection Systems*.

9.6 Special Hazards.

9.6.1 Open Burning.

9.6.1.1* No open burning shall be permitted.

9.6.1.2 Open flame heating devices shall not be allowed other than as permitted by the following:

(1) NFPA 31, *Standard for the Installation of Oil-Burning Equipment*
(2) NFPA 54/ANSI Z223.1, *National Fuel Gas Code*
(3) NFPA 58, *Liquefied Petroleum Gas Code*

(4) *NFPA 70, National Electrical Code*
(5) NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*
(6) NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems*
(7) NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel–Burning Appliances*

9.6.1.3 For animal housing facilities with fuel-burning appliances or equipment, carbon monoxide detection shall be installed in accordance with NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment.*

9.6.2 Smoking.

9.6.2.1 Smoking shall be prohibited except in designated safe areas.

9.6.2.2 Warning signs shall be posted.

9.6.3 Waste Removal and Housekeeping.

9.6.3.1 A procedure for general housekeeping, cleanliness, animal waste removal, and orderliness shall be maintained.

9.6.3.2 Detached noncombustible trash containers, for other than animal waste, shall be provided and a frequent removal program shall be established.

9.6.3.3 Aisles, hallways, or other types of corridors of animal housing facilities shall not be used in any form for permanent storage.

9.6.4 Electrical Systems and Appliances.

9.6.4.1 Electrical systems and appliances shall be installed in accordance with the requirements of *NFPA 70, National Electrical Code.*

9.6.4.2 Use of any portable electrical appliance shall be restricted as follows:

(1) Multiple-outlet adapters shall be prohibited.
(2) Not more than one continuous extension cord shall be used to connect one appliance to the fixed receptacle, and such cord shall be listed for hard service and properly sized for the intended application.
(3) Extension cords shall be used only on a temporary (immediate) basis.

9.6.4.3 Extension cords shall not be supported by any metal objects such as nails, screws, hooks, or pipes.

9.6.4.4 Plug caps and receptacles used in extension cords shall be heavy-duty type equipped with a reliable grounding pole and shall be attached to the cord in a manner to provide strain relief.

9.6.4.5 All electrical appliances used in the animal housing facility shall be listed for commercial use.

9.6.4.6 Outdoor electrical appliances served by the animal housing facility's electrical system shall be installed in accordance with *NFPA 70, National Electrical Code.*

9.6.4.7 Portable cooking and heating appliances shall be used only in spaces designated for such use and separated from the animal housing facility.

9.6.4.8 Portable electrical heating and cooking appliances shall be of a type that automatically interrupts electrical current to the heating element when the appliance is not in its normal operating position (tip-over disconnect).

9.6.4.9 Use of exposed-element heating appliances, such as immersion heaters and space heaters, shall be prohibited.

9.6.4.10 Receptacles and wiring shall be installed in positions that minimize the possibility of damage by or injury to the animal occupants.

9.6.4.11 Permanently installed lighting shall be provided throughout the animal housing facility.

9.6.5 Flammable Liquids. The storage of flammable and combustible liquids, except those used for medicinal purposes, shall be prohibited.

9.6.6 Control of Vehicular Traffic.

9.6.6.1 All vehicular access shall be subject to local established rules.

9.6.6.2 Aisles, hallways, and other types of corridors shall be maintained clear of obstruction at all times, and access to fire equipment shall not be blocked.

9.7 Vertical Openings. Where required by the AHJ, every vertical opening between the floors of an animal housing facility shall be enclosed or protected, as necessary, to provide the following:

(1) Reasonable safety to animal and human occupants while using the means of egress by preventing spread of fire, smoke, or fumes through vertical openings from floor to floor to allow occupants to complete their use of the means of egress
(2) Limitation of damage to the facility and its contents

9.8 Special Requirements for Category A Animals.

9.8.1 Sprinkler Systems. Animal housing facilities with Category A animals shall be sprinklered throughout in accordance with Section 9.2.

9.8.2 Smoke Control Systems. Animal housing facilities with Category A animals shall have a smoke control system unless modified as approved by the AHJ.

9.8.2.1* Smoke control systems shall be installed, inspected, tested, and maintained in accordance with NFPA 92, *Standard for Smoke Control Systems*, or nationally recognized standards, engineering guides, or recommended practices.

9.8.2.2 The engineer of record shall clearly identify the intent of the system, the design method used, the appropriateness of the method used, and the required means of inspecting, testing, and maintaining the system.

9.8.2.3 Acceptance testing shall be performed by a special inspector in accordance with the following:

(1) Special inspections and tests shall be performed to verify the operation of the smoke control system in its final condition for acceptance by the AHJ.
(2) The design documents shall provide the procedures and methods to be used and items subject to special inspections and tests.
(3) The special inspector shall submit an inspection and test report to the AHJ and registered design professional in responsible charge.

9.8.2.4 Smoke Control System Operation.

9.8.2.4.1 Smoke control systems shall be automatically activated by sprinkler waterflow, smoke detection, or other approved detection systems in accordance with *NFPA 72.* Smoke

control systems shall remain operational throughout the emergency.

9.8.2.4.2 Means for manual operation of smoke control systems shall be provided at an approved location.

9.8.3* Areas Requiring Human Attendance. With the approval of the AHJ, surgical, procedure, and treatment areas where the animals are anesthetized or otherwise require human attendance shall be designed, constructed, and maintained with a defend-in-place strategy to allow continued human attendance to minimize the unnecessary loss of animal life.

9.8.4* Additional Safeguards. For animal housing facilities with Category A animals, the AHJ shall be permitted to require additional safeguards necessary to protect animal occupants that cannot be safely evacuated.

Chapter 10 Interior Finishes, Contents, and Furnishings

10.1 General.

10.1.1 Interior finishes, contents, and furnishings shall be in accordance with Section 10.2 of NFPA *101*, *Life Safety Code*, or Sections 10.2 and 10.3 of *NFPA 5000*, *Building Construction and Safety Code*, and this chapter.

10.1.1.1 Interior wall and ceiling finish materials shall be Class A or Class B in accordance with ASTM E 84, *Standard Test Method of Surface Burning Characteristics of Building Materials*, or ANSI/UL 723, *Standard for Test of Surface Burning Characteristics of Building Materials*, in exits and in exit access corridors.

10.1.1.2 Interior wall and ceiling finish materials shall be Class A, Class B, or Class C in accordance with ASTM E 84 or ANSI/UL 723 in all other areas.

10.1.1.3 Interior wall and ceiling finish materials tested in accordance with NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, and complying with the requirements shown in Section 10.2 of NFPA *101* or Sections 10.2 and 10.3 of *NFPA 5000*, shall be permitted to be used in all areas where a Class A, Class B, or Class C finish material is used in accordance with ASTM E 84 or ANSI/UL 723.

10.1.2 The toxicity of finishes, contents, furnishings, and their treatments for the animals housed in the facility shall be minimized.

10.2 Insulation. Exposed insulation shall not be permitted in animal housing facilities.

Chapter 11 Class 1 Animal Housing Facilities

11.1 General.

11.1.1* Application. Class 1 animal housing facilities shall be in accordance with NFPA *101*, *Life Safety Code*, Chapter 42, or *NFPA 5000*, *Building Construction and Safety Code*, Chapter 30, as a minimum, and this chapter.

11.1.2 Minimum Construction Requirements. Class 1 animal housing facilities shall be constructed in accordance with Chapter 7.

11.1.3 Occupant Load.

11.1.3.1* Human Occupants. In Class 1 animal housing facilities, the occupant load, in number of persons for whom means of egress and other provisions are required, shall be determined in accordance with NFPA *101*, *Life Safety Code*, Chapter 42, or *NFPA 5000*, *Building Construction and Safety Code*, Chapter 30, as a minimum.

11.1.3.2 Animal Occupants. In Class 1 animal housing facilities, the occupant load, in number of animals for whom means of egress and other provisions are required, shall be determined in accordance with Chapter 8.

11.2 Means of Egress Requirements.

11.2.1 General. Each required means of egress shall be in accordance with the applicable portions of Chapter 8.

11.2.2 Means of Egress Components.

11.2.2.1 General. Components of means of egress shall be limited to the types described in NFPA *101*, *Life Safety Code*, Chapter 7; or *NFPA 5000*, *Building Construction and Safety Code*, Chapter 11; Chapter 8 of this standard; and as modified in this subsection.

11.2.2.2 Ramps.

11.2.2.2.1 Ramps complying with NFPA *101*, *Life Safety Code*, and *NFPA 5000*, *Building Construction and Safety Code*, shall be permitted for human occupants.

11.2.2.2.2* Ramps for animal egress shall be designed to safely accommodate the animal occupants.

11.2.3 Number of Means of Egress. See Chapter 8.

11.2.4 Special Means of Egress Features. (Reserved)

11.3 Protection.

11.3.1 Detection, Alarm, and Communications Systems.

11.3.1.1 General. A fire alarm system in accordance with Section 9.3 shall be required in accordance with this subsection.

11.3.1.1.1 In animal housing facilities greater than 3000 ft^2 (280 m^2) but no more than 20,000 ft^2 (1860 m^2), a local fire alarm system shall be provided.

11.3.1.1.2 In animal housing facilities greater than 20,000 ft^2 (1860 m^2), a monitored fire alarm system shall be provided.

11.3.1.2 Existing Systems. Approved existing installations shall be permitted to be continued in use.

11.3.2 Carbon Monoxide Detection Systems. For animal housing facilities with fuel-burning appliances or equipment, carbon monoxide detection shall be installed in accordance with 9.6.1.3.

11.3.3 Fire Extinguishers. Fire extinguishers shall be provided in accordance with Section 9.4.

11.3.4 Lightning Protection. Lightning protection shall be required in accordance with Section 9.5.

11.3.5 Special Hazards. Special hazards shall be addressed in accordance with Section 9.6.

11.3.6 Vertical Openings. Where required by the AHJ, vertical openings shall be in accordance with Section 9.7.

11.3.7 Special Requirements for Category A Animals. Class 1 animal housing facilities with Category A animals shall be in accordance with Section 9.8.

11.3.8 Interior Finishes, Contents, and Furnishings. Interior finishes, contents, and furnishings shall be in accordance with Chapter 10.

11.4 Operating Features.

11.4.1 Disaster/Emergency Management Programs. A disaster/emergency management program shall be required in accordance with 4.3.4.

11.4.2 Disaster/Emergency Drills. In all Class 1 animal housing facilities, animal handlers, employees, and supervisory personnel shall hold disaster/emergency drills once annually in accordance with 4.3.5.

11.4.3 Extinguisher Training. All employees of Class 1 animal housing facilities shall be annually instructed in the use of portable fire extinguishers.

Chapter 12 Class 2 Animal Housing Facilities

12.1 General.

12.1.1* Application. Class 2 animal housing facilities shall be in accordance with NFPA *101, Life Safety Code*, Chapter 38, or *NFPA 5000, Building Construction and Safety Code*, Chapter 28, as a minimum, and this chapter.

12.1.2 Minimum Construction Requirements. Class 2 animal housing facilities shall be constructed in accordance with Chapter 7.

12.1.3 Occupant Load.

12.1.3.1 Human Occupants. The occupant load, in number of persons for whom means of egress and other provisions are required, shall be determined in accordance with NFPA *101*, *Life Safety Code*, Chapter 38, or *NFPA 5000, Building Construction and Safety Code*, Chapter 28, as a minimum.

12.1.3.2 Animal Occupants. In Class 2 animal housing facilities, the occupant load, in number of animals for whom means of egress and other provisions are required, shall be determined in accordance with Chapter 8.

12.2 Means of Egress Requirements.

12.2.1 General. Each required means of egress shall be in accordance with the applicable portions of Chapter 8.

12.2.2 Means of Egress Components.

12.2.2.1 General. Components of means of egress shall be limited to the types described in NFPA *101*, *Life Safety Code*, Chapter 7; or *NFPA 5000*, *Building Construction and Safety Code*, Chapter 11; Chapter 8 of this standard; and as modified in this subsection.

12.2.2.2 Ramps.

12.2.2.2.1 Ramps complying with NFPA *101*, *Life Safety Code*, and *NFPA 5000*, *Building Construction and Safety Code*, shall be permitted for human occupants.

12.2.2.2.2* Ramps for animal egress shall be designed to safely accommodate the animal occupants.

12.2.3 Number of Means of Egress. See Chapter 8.

12.2.4 Special Means of Egress Features. (Reserved)

12.3 Protection.

12.3.1 Detection, Alarm, and Communications Systems.

12.3.1.1 General. A fire alarm system in accordance with Section 9.3 shall be required in accordance with this subsection.

12.3.1.1.1 In animal housing facilities greater than 3000 ft^2 (280 m^2) but no more than 10,000 ft^2 (930 m^2), a local fire alarm system shall be provided.

12.3.1.1.2 In animal housing facilities greater than 10,000 ft^2 (930 m^2), a monitored fire alarm system shall be provided.

12.3.1.2 Existing Systems. Approved existing installations shall be permitted to be continued in use.

12.3.2 Carbon Monoxide Detection Systems. For animal housing facilities with fuel-burning appliances or equipment, carbon monoxide detection shall be installed in accordance with 9.6.1.3.

12.3.3 Fire Extinguishers. Fire extinguishers shall be provided in accordance with Section 9.4.

12.3.4 Lightning Protection. Lightning protection shall be required in accordance with Section 9.5.

12.3.5 Special Hazards. Special hazards shall be addressed in accordance with Section 9.6.

12.3.6 Vertical Openings. Where required by the AHJ, vertical openings shall be in accordance with Section 9.7.

12.3.7 Special Requirements for Category A Animals. Class 2 animal housing facilities with Category A animals shall be in accordance with Section 9.8.

12.3.8 Interior Finishes, Contents, and Furnishings. Interior finishes, contents, and furnishings shall be in accordance with Chapter 10.

12.4 Operating Features.

12.4.1 Disaster/Emergency Management Programs. A disaster/emergency management program shall be required in accordance with 4.3.4.

12.4.2 Disaster/Emergency Drills. In all Class 2 animal housing facilities, animal handlers, employees, and supervisory personnel shall hold disaster/emergency drills annually in accordance with 4.3.5.

12.4.3 Extinguisher Training. All employees of Class 2 animal housing facilities shall be annually instructed in the use of portable fire extinguishers.

Chapter 13 Class 3 Animal Housing Facilities

13.1 General.

13.1.1* Application. Class 3 animal housing facilities shall be in accordance with NFPA *101*, *Life Safety Code*, Chapter 36, or *NFPA 5000, Building Construction and Safety Code*, Chapter 27, as a minimum, and this chapter.

13.1.2 Minimum Construction Requirements. Class 3 animal housing facilities shall be constructed in accordance with Chapter 7.

13.1.3 Occupant Load.

13.1.3.1 Human Occupants. The occupant load, in number of persons for whom means of egress and other provisions are required, shall be determined in accordance with NFPA *101*, *Life Safety Code*, Chapter 36, or *NFPA 5000, Building Construction and Safety Code*, Chapter 27, as a minimum.

13.1.3.2 Animal Occupants. In Class 3 animal housing facilities, the occupant load, in number of animals for whom means of egress and other provisions are required, shall be determined in accordance with Chapter 8.

13.2 Means of Egress Requirements.

13.2.1 General. Each required means of egress shall be in accordance with the applicable portions of Chapter 8.

13.2.2 Means of Egress Components.

13.2.2.1 General. Components of means of egress shall be limited to the types described in NFPA *101*, *Life Safety Code*, Chapter 7; or *NFPA 5000, Building Construction and Safety Code*, Chapter 11; Chapter 8 of this standard; and as modified in this subsection.

13.2.2.2 Ramps.

13.2.2.2.1 Ramps complying with NFPA *101*, *Life Safety Code*, and *NFPA 5000, Building Construction and Safety Code*, shall be permitted for human occupants.

13.2.2.2.2* Ramps for animal egress shall be designed to safely accommodate the animal occupants.

13.2.3 Number of Means of Egress. See Chapter 8.

13.2.4 Special Means of Egress Features. (Reserved)

13.3 Protection.

13.3.1 Detection, Alarm, and Communications Systems.

13.3.1.1 General. A monitored fire alarm system in accordance with Section 9.3 shall be required in all Class 3 animal housing facilities.

13.3.1.2 Existing Systems. Approved existing installations shall be permitted to be continued in use.

13.3.2 Carbon Monoxide Detection Systems. For animal housing facilities with fuel-burning appliances or equipment, carbon monoxide detection shall be installed in accordance with 9.6.1.3.

13.3.3 Fire Extinguishers. Fire extinguishers shall be provided in accordance with Section 9.4.

13.3.4 Lightning Protection. Lightning protection shall be required in accordance with Section 9.5.

13.3.5 Special Hazards. Special hazards shall be addressed in accordance with Section 9.6.

13.3.6 Vertical Openings. Where required by the AHJ, vertical openings shall be in accordance with Section 9.7.

13.3.7 Special Requirements for Category A Animals. Class 3 animal housing facilities with Category A animals shall be in accordance with Section 9.8.

13.3.8 Interior Finishes, Contents, and Furnishings. Interior finishes, contents, and furnishings shall be in accordance with Chapter 10.

13.4 Operating Features.

13.4.1 Disaster/Emergency Management Programs. A disaster/emergency management program shall be required in accordance with 4.3.4.

13.4.2 Disaster/Emergency Drills. In all Class 3 animal housing facilities, animal handlers, employees, and supervisory personnel shall hold disaster/emergency drills semiannually in accordance with 4.3.5.

13.4.3 Extinguisher Training. All employees of Class 3 animal housing facilities shall be annually instructed in the use of portable fire extinguishers.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1.1 The requirements of NFPA 150 recognize the following fundamental principles:

(1) Animals are sentient beings with a value greater than that of simple property.
(2) Animals, both domesticated and feral, lack the ability of self-preservation when housed in buildings and other structures.
(3) Current building, fire, and life safety codes do not address the life safety of the animal occupants.

The requirements found in NFPA 150 are written with the intention that animal housing facilities will continue to be designed, constructed, and maintained in accordance with the applicable building, fire, and life safety codes. The requirements herein are not intended to replace or rewrite the basic requirements for the human occupants. Instead, NFPA 150 provides additional minimum requirements for the protection of the animal occupants and the human occupants who interact with those animals in these facilities.

NFPA 150 is divided into three major sections: The first section, Chapters 1 through 3, contains only administrative requirements, while the second section, Chapters 4 through 10, provides general requirements for all facilities housing animals (i.e., facility subclassification, animal category, construction, means of egress, fire protection, and interior finish requirements), and the third section, Chapters 11–13, includes specific requirements focused on the class of the facility.

A.1.3.1 While it would be appropriate for NFPA 150 to clearly establish a minimum number of animals above which the requirements of NFPA 150 apply, the necessary technical information to make these decisions is simply not available at this time. Instead, in 1.3.1, it is stated that, if a facility requires a permit or license from the local, state, or federal authorities to function, it must comply with this standard. With this approach, it is understood that an adopting jurisdiction could further modify the application of the standard to fit its local situation.

A.1.3.4 In this particular situation, the definition of *temporary* is left to the applicable building, life safety, and fire codes enforced in the jurisdiction.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evalu-

ate 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 that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase "authority having jurisdiction," or its acronym AHJ, 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.

A.3.2.4 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations 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.3.3.2.1 Confined Animals. This includes animals in pens near or adjacent to a structure where they would be endangered by smoke, heat, fire spread, or structural failure.

A.3.3.3 Animal Handler. This includes but is not limited to attendants, exhibitors, hands, keepers, groomers, technicians, trainers, veterinarians, wranglers, or their assistants.

A.3.3.4 Animal Housing Facility. This includes but is not limited to barns, kennels, coops, stables, sheds, pens, corrals, runs, vivaria, terraria, laboratories, and zoos. Adjacent exterior spaces include areas near or adjacent to a structure where confined animals would be endangered by smoke, heat, fire spread, or structural failure.

A.3.3.17 Protection. For the purposes of this standard, *protection* takes various distinct forms. The specific provision of the standard will address what the standard intends as an acceptable device, material, or system. With regard to structural fire protection, *protection* or *protected* usually means an assembly of materials that have achieved a specified level of fire resistance as demonstrated by NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials* (withdrawn). For fire suppression systems, *protected* usually means being provided with an approved automatic sprinkler system or similar automatic fire suppression system. The type of *protection* desired must be clearly understood within the context of the item under consideration.

A.4.1 The overall goals of this standard are presented in 4.1.1. These overall goals are treated in greater depth in 4.1.3 and 4.1.4. In each of these subsections, an overall goal for the subsection is defined, specific goals relating to the overall goal are presented, and the objectives that relate to the specific goal follow. This format is intended to enhance the usability of the standard.

A.4.1.1 These highest level goals are intentionally general in nature. Each includes a broad spectrum of topics as shown in 4.1.3 and 4.1.4. Property protection is not included as a highest level goal, as it is contained in most of the other goals.

Safety is intended to indicate a need for protection against immediate or short-duration hazards, such as a fire or similar emergency.

A.4.1.2 The objectives are stated in more specific terms than the goals and tend to be more quantitative.

A.4.1.3.1.1 The phrase "reasonably safe from fire" is defined by subsequent language in this standard, primarily in the objectives.

A.4.1.3.1.2.2 In many cases, the other provisions of the standard that provide safety for occupants will satisfy this goal for protection of emergency responders.

A.4.1.3.2.1 The phrase "reasonably safe during normal use" is defined by subsequent language in this standard, primarily in the objectives. Certain requirements are provided to ensure that the occupants are safe during nonemergency use of the buildings. Failure to address these features could result in injuries to occupants in their normal day-to-day activities in the building.

A.4.1.3.2.2.3 Appropriate consideration should be given to the type of audible device selected, since some animals might respond in a detrimental way given a certain signal (e.g., a bell would be inappropriate as a fire alarm in a racetrack stable).

A.4.1.4.1.1 The long-term function of a building, in total, is not within the scope of this goal. This goal relates, however, to the long-term, continued operation and effectiveness of the building to satisfy the goals of safety and usability.

A.4.1.4.1.2 This objective is intended to apply to systems, features, and construction that are provided in the building for the purpose of meeting the other objectives and is not intended to apply to nonrequired systems, features, and construction.

A.4.2.4 Fire alarms alert occupants to initiate emergency procedures, facilitate orderly conduct of fire drills, and initiate response by emergency services.

A.4.3.1.3 This standard is not intended to address every conceivable arrangement of construction or use of animal housing facilities. These structures are unique in that the life safety of two important, but dramatically different, forms of life are addressed — humans and animals. These structures often involve the interaction of animals and people that are unfamiliar with one another's reaction to fire or other emergency conditions. For instance, for mobility impaired or other disabled individuals, the ability of the humans to egress can be impaired, hindered, or jeopardized by the movement of the animals. These facilities can also be located within or close to a process or other occupancy that elevates the risk to animals, but perhaps not to humans, beyond that contemplated by the standard. These facilities can be housed in a historic building.

If these or other special circumstances clearly exist, the AHJ can require alternative or additional fire protection features. These can include, but are not limited to, a performance-based analysis of the special condition, building fire evacuation plans, management policies on staff response to emergencies, a higher

staff-to-client ratio, increased fire resistance ratings, or modification of fire suppression or fire alarm requirements.

A.4.3.4.2.1 Disaster/emergency management programs should include the following items based on the type of occupancy and hazards involved:

(1) Procedures for reporting of emergencies requiring relocation and/or evacuation of occupants
(2) Occupants or staff member duties during emergencies
(3) Floor plans identifying the locations of portable fire extinguishers, other manual fire-extinguishing equipment, other automatic or manual fire suppression systems, first aid equipment, hazardous material spill equipment, and equipment designated as necessary for the evacuation of animals
(4) Manual fire alarm pull stations and fire alarm control panels
(5) Floor plans identifying the primary and secondary routes of evacuation for each room or portion of the occupancy
(6) Floor plans indicating the locations of interior areas of refuge and animal occupied areas
(7) Site maps identifying the designated exterior assembly area for each evacuation route
(8) Assessments of both building systems and management features
(9) Use of alarms
(10) Transmission of alarm to fire department
(11) Response to alarms
(12) Procedures for isolation and/or extinguishment of fire
(13) Properties and location of hazardous storage or operations
(14) Special procedures for staff members who perform or shut down critical plant operations and/or attend to Category A animals
(15) A system to account for animal and human occupants and staff members after evacuation
(16) Designation of an emergency response coordinator and a back-up coordinator
(17) An alternate means of communications other than the fire alarm
(18) Emergency contact information
(19) Special procedures for animal handlers to address such items as animal bites and animal escapes

A.4.3.5 The purpose of disaster/emergency drills is to educate the participants in the fire safety features of the building, the egress facilities available, safe handling of the animal occupants, and the procedures to be followed. Speed in emptying buildings or relocating occupants, while desirable, is not the only objective. Prior to an evaluation of the performance of a disaster/emergency drill, an opportunity for instruction and practice should be provided. This educational opportunity should be presented in a nonthreatening manner, with consideration to the prior knowledge, age, and ability of the audience.

A.4.3.5.2.2 If a disaster/emergency drill is considered merely as a routine exercise from which some persons are allowed to be excused, there is a grave danger that, in an actual emergency, the evacuation and relocation will not be successful. However, there could be circumstances under which all occupants do not participate in a disaster/emergency drill.

A.5.1 The performance-based option of this standard establishes acceptable levels of risk for buildings and structures as addressed in Section 1.2. While the performance-based option of this standard does contain goals, objectives, and performance criteria necessary to provide for an acceptable level of risk, it does not describe how these goals, objectives, and performance criteria are to be met. Design and engineering are needed to meet the provisions of Chapter 5.

A.5.1.3 A third-party reviewer is a person or group of persons chosen by the authority having jurisdiction to review proposed performance-based designs. Qualifications of the third-party reviewer should include experience, education, and credentials that demonstrate knowledgeable and responsible use of applicable models and methods.

A.5.1.5 For guidance on reviewing performance-based designs, see the SFPE *Enforcer's Guide to Performance-Based Design Review*. Additional guidance on reviewing designs in which fire risk analysis is used can be found in NFPA 551, *Guide for the Evaluation of Fire Risk Assessments*.

A.5.1.6 Continued compliance with the goals and objectives of the standard involves many factors. The building construction — including openings, interior finish, and fire- and smoke-resistive construction — and the building and fire protection systems need to retain at least the same level of performance as is provided for the original design parameters. The use and occupancy should not change to the degree that assumptions made about the occupant characteristics, combustibility of furnishings, and existence of trained personnel are no longer valid. In addition, actions provided by other personnel, such as emergency responders, should not be diminished below the documented assumed levels. Also, actions necessary to maintain reliability of systems at the anticipated level need to meet the initial design criteria.

A.5.2.2.2 In many cases, the other provisions of the standard that provide safety for occupants will satisfy this goal for protection of emergency responders.

A.5.2.3.1 The phrase "reasonably safe during normal use" is defined by subsequent language in this standard, primarily in the objectives. Certain requirements are provided to ensure that the occupants are safe during nonemergency use of the buildings. Failure to address these features could result in injuries to occupants in their normal day-to-day activities in the building.

A.5.2.3.2.3 Appropriate consideration should be given to the type of audible device selected, since some animals might respond in a detrimental way given a certain signal (e.g., a bell would be inappropriate as a fire alarm in a racetrack stable).

A.5.4 In the context of this standard, design characteristics are those attributes of the building and its location, systems, contents, and occupants that need to be specified or quantified, or both, to allow evaluation of a design with respect to the goals, objectives, and performance criteria, using appropriate design scenarios and verification methods. Some design characteristics are specified in this standard. Others might be specified by the authority having jurisdiction to accommodate local conditions, and still others might be specified by the designer of the building.

A.5.4.1.5 This requirement includes assumptions about the interrelations between the performance of building elements and systems, occupant behavior, or emergency response actions that conflict with each other. For each design scenario, care needs to be taken to ensure that conflicts in actions do not occur. Typical conflicts could include the following:

(1) Assuming a fire door will remain closed during the fire to contain smoke, while this same door is used by occupants during egress from the area

(2) Assuming fire apparatus will arrive immediately from a distant location to provide water to fire department connections.

For example, an assumption that compartmentation blocking the passage of fire and smoke will be maintained at the door to a stairwell cannot be paired with an assumption that evacuation through that door will extend over many minutes.

A.5.4.2.1 Building contents and furnishings are not normally included in design specifications; however, in some cases, they might have an impact on building or occupant behavior. Where contents and furnishings could affect building or occupant behavior, the designer must present the authority having jurisdiction with detailed information about such contents and furnishings and their locations in the building to enable an assessment of their impact in various design scenarios to be determined. A designer must also clearly express the overall layout of the building, especially those items that might not appear on building plans but that could affect the performance of the building or the occupants. Examples include the layout of office cubicles that could affect emergency egress and temporary storage areas that could exceed permissible loading for a portion of a floor assembly.

A.5.4.2.2 Systems addressed by this requirement include but are not limited to automatic fire suppression systems and fire alarm systems. Performance issues that need to be documented might include response time indexes, discharge densities, and waterflow distribution patterns. Calculations should not include an unlimited supply of extinguishing agent if only a limited supply will be provided in the actual structure or building.

A.5.4.3.1 Guidance on human characteristics for use in design can be found in the SFPE *Engineering Guide to Predicting Human Behavior in Fire*. Guidance on animal characteristics for use in design can be formulated based on discussions with facility staff, animal handlers, researchers, and other subject matter experts including but not limited to industry associations and regulatory agencies.

A.5.4.3.5 The guidelines cited in A.7.3 for the minimum areas for stalls, cages, and enclosure areas can be used to develop appropriate occupant loads for the animal occupants. For animals not covered in A.7.3, other recognized industry guidelines should be consulted. The number of people expected to be contained in a room or area should be based on the occupant load factor specified in other approved sources.

A.5.4.3.6 For example, in research facilities, staff characteristics such as number, location, quality, and frequency of training should be considered.

A.5.5 Many events can occur during the life of a building; some have a higher probability of occurrence than others. Some events, though not typical, could have a devastating effect on a building. A reasonable design should be able to achieve the goals, objectives, and performance criteria of this standard for any typical or common design scenario and for some of the nontypical, potentially devastating scenarios, up to a level commensurate with society's expectations as reflected in this standard.

The challenge in selecting design scenarios is finding a manageable number that are sufficiently diverse and representative so that, if the design is reasonably safe for those scenarios, it should then be reasonably safe for all scenarios, except for those specifically excluded as being unrealistically severe or sufficiently infrequent to be fair tests of the design.

A.5.8.1 The SFPE *Engineering Guide to Performance-Based Fire Protection Analysis and Design of Buildings* describes the documentation that should be provided for a performance-based design.

Proper documentation of a performance design is critical to the design acceptance and construction. Proper documentation will also ensure that all parties involved understand what is necessary for the implementation, maintenance, and continuity of the fire protection design. If attention to detail is maintained in the documentation, then there should be little dispute during approval, construction, start-up, and use. Poor documentation could result in rejection of an otherwise good design, poor implementation of the design, inadequate system maintenance and reliability, and an incomplete record for future changes or for testing the design forensically.

A.5.8.11 Documentation for modeling should conform to ASTM E 1472, *Standard Guide for Documenting Computer Software for Fire Models*, although most, if not all, models were originally developed before this standard was promulgated.

A.6.1.1 The user should reference *NFPA 5000*, *Building Construction and Safety Code*, or NFPA *101*, *Life Safety Code*, to obtain the general occupancy classification of an animal housing facility whether it's storage, business, mercantile, assembly, or other occupancy. If there are multiple occupancies within the facility, they will be in accordance with the mixed or separated occupancy requirements in *NFPA 5000*, Chapter 6, or NFPA *101*, Chapter 6. NFPA 150 and its subclassification, defined in Section 6.2, are intended to apply only to those portions of the facility housing animals.

A.6.2.1.1 Class 1 facilities include but are not limited to rest, feed, work, exercise, viewing, and production areas at facilities where there is no general public access or physical interaction with the animal occupants. These types of facilities include but are not limited to livestock and poultry processing plants, dairy barns, private breeding facilities, treatment and holding areas in veterinary clinics or hospitals, educational facilities, quarantine areas, respite facilities, and private kennel areas. It is assumed that these facilities will have no access by the general public, as defined in Chapter 3.

A.6.2.1.2 Class 2 facilities include but are not limited to rest, feed, work, exercise, viewing, and production areas at facilities where there is restricted general public access and interaction with the animal occupants. Restricted general public access permits limited access for people on an infrequent basis who do not have an intimate knowledge of the layout of the building or structure or the general behavior of the animals.

A.6.2.1.3 Class 3 facilities include but are not limited to rest, feed, work, exercise, production, or viewing areas at facilities where there is general public access and interaction with the animal occupants. These types of facilities include but are not limited to zoo display areas, petting zoos, show grounds/barns, and pet stores. General public access includes regular access for people who do not have an intimate knowledge of the layout of the building or structure or the general behavior of the animals.

A.6.2.4.1 See Figure A.6.2.4.1(a) and Figure A.6.2.4.1(b) for illustrations of the multiple subclassifications.

A.6.2.4.2 An example of a minor accessory subclassification could be a small public viewing area at a dairy production facility. The barn might meet the subclassification for a Class 1 facility. If the other subclassification is less than 25 percent of the gross floor area of the animal housing facility, then the

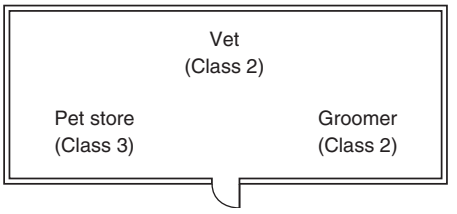

FIGURE A.6.2.4.1(a) Multiple Mixed Subclass.

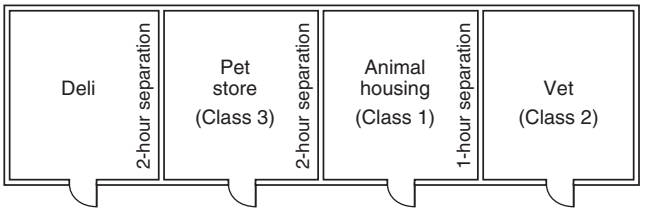

FIGURE A.6.2.4.1(b) Multiple Separated Subclass.

provisions of a multiple subclassification would not apply, and the facility could be classified as the predominant subclassification (in this example, Class 1).

A.6.3.1.1(1) This includes wild or feral animals, zoonotic disease carriers, or poisonous animals.

A.6.3.1.1(2) This includes animals that are under anesthesia, injured or ill, immune-deficient, or infectious disease carriers.

A.6.3.1.1(3) This includes animals that are wild or feral, too large or too numerous, or in situations where there is inadequate staff-to-animal ratio for evacuation purposes or inadequate safeguards to deal with evacuated animals.

A.6.3.1.1(4) This includes animals that cannot be lead by collars, halters, or other devices and equipment and animals that are not in mobile or rolling cages.

A.7.1 Table A.7.1 is a reprint of Table 7.2.1.1 from *NFPA 5000, Building Construction and Safety Code*.

A.7.2.2 The areas on this table are derived by taking the area limitations listed in NFPA 150, *Standard on Fire Safety in Racetrack Stables*, 2000 edition, and dividing them by the number of stalls permitted. This yields an average area per stall of 250 ft^2 (23.23 m^2). This area is then used to formulate an acceptable area for a facility housing animals. Since Category A animals are those animals that cannot be released safely from a facility during a fire or other emergency, the requirement for facilities housing Category A animals to be protected by automatic sprinkler systems is triggered. The story limitations in the table are based upon those found in Table 7.4.1 of *NFPA 5000, Building Construction and Safety Code*, for ordinary hazard storage occupancies.

A.7.3 Table A.7.3 provides guidelines for the minimum areas for stalls, cages, and enclosure areas for various types of animals. These numbers are derived from the American Zoo and Aquarium Association's *Minimum Husbandry Guidelines for Mammals*. Additional guidelines can be found in the Institute of Laboratory Animal Resources Commission on Life Sciences' "Guide for the Care and Use of Laboratory Animals."

A.7.5.2 Table A.7.5.2 lists the recommended animal enclosure horizontal design forces for a sampling of animals.

A.8.1.1 A holding area can be a temporary or permanent, internal or external area that provides a safe environment for an animal during an emergency. It could include, but is not limited to, a movable enclosure, pen, yard, paddock, or corral.

A.8.1.2.2(2) The width of the animal should be the widest part of the animal, including horns, antlers, and other appendages.

A.8.1.2.4 Exit distances are more stringent than those specified in NFPA *101, Life Safety Code*, because of the difficulty of evacuating panicked animals from the facility in an emergency situation.

A.8.2 The guidelines cited in A.7.3 for the minimum areas for stalls, cages, and enclosure areas can be used to develop appropriate occupant loads for the animal occupants.

A.9.3.2.1 Consideration should be given to animal reactions and undue stress caused by audible sounds or flashing strobes. For example, in zoos, an acknowledge station where the keeper can disengage the notification appliances only in the animal areas could be incorporated into the design where acceptable to the AHJ. After the notification appliances are deactivated, another means, such as a red beacon, could be used as an alternative notification method. Other means acceptable to the AHJ might be more suitable for other animal housing occupancies.

A.9.6.1.1 This restriction is intended primarily to prohibit open flame heaters in the barn and stable-type areas. It is not intended to limit properly installed and equipped devices such as gas water heaters and blacksmith forges as long as they are approved by the AHJ.

A.9.8.2.1 Because most animals require shelter in place, a smoke control system of some type is required. Tenable conditions such as the maximum and minimum exposure temperatures, sensitivity to sudden changes in temperature, maximum carbon monoxide concentrations, and the acceptable smoke layer height above the finished floor during a fire condition are not available for many animals. Data for design of an effective smoke control system can be obtained from facility staff, animal handlers, researchers, and other subject matter experts, including industry associations and regulatory agencies.

A.9.8.3 It is anticipated that if staff is to remain with anesthetized animals or animals that cannot be left unattended, additional safeguards would be necessary to ensure the safety of both human and animal occupants.

A.9.8.4 Additional safeguards can include such items as two-way communication, secondary animal containment, smoke compartments, and emergency response training and equipment in accordance with 4.3.4 (i.e., tranquilizers and other animal control equipment, and first-aid items).

A.11.1.1 Class 1 facilities are those facilities that are most closely related to storage occupancies. That is to say, they are characterized by relatively low human occupant loads in relation to the large size of the floor areas. The requirements found in Chapter 11 compare most closely to those requirements found in Chapter 42 of NFPA *101, Life Safety Code*. By no means should a Class 1 animal housing facility be automatically classified as a storage occupancy. The occupancy of an animal housing facility should be determined in accordance with NFPA *101* or *NFPA 5000, Building Construction and Safety Code*, based on the intended use of that facility. NFPA 150 makes additional requirements to safeguard the animal life within that facility.

Table A.7.1 Fire Resistance Ratings for Type I Through Type V Construction (hr)

	Type I		Type II			Type III		Type IV	Type V	
Construction Element	**442**	**332**	**222**	**111**	**000**	**211**	**200**	**2HH**	**111**	**000**
Exterior Bearing Walls[a]										
Supporting more than one floor, columns, or other bearing walls	4	3	2	1	0[b]	2	2	2	1	0[b]
Supporting one floor only	4	3	2	1	0[b]	2	2	2	1	0[b]
Supporting a roof only	4	3	1	1	0[b]	2	2	2	1	0[b]
Interior Bearing Walls										
Supporting more than one floor, columns, or other bearing walls	4	3	2	1	0	1	0	2	1	0
Supporting one floor only	3	2	2	1	0	1	0	1	1	0
Supporting roofs only	3	2	1	1	0	1	0	1	1	0
Columns										
Supporting more than one floor, columns, or other bearing walls	4	3	2	1	0	1	0	H	1	0
Supporting one floor only	3	2	2	1	0	1	0	H	1	0
Supporting roofs only	3	2	1	1	0	1	0	H	1	0
Beams, Girders, Trusses, and Arches										
Supporting more than one floor, columns, or other bearing walls	4	3	2	1	0	1	0	H	1	0
Supporting one floor only	2	2	2	1	0	1	0	H	1	0
Supporting roofs only	2	2	1	1	0	1	0	H	1	0
Floor-Ceiling Assemblies	2	2	2	1	0	1	0	H	1	0
Roof-Ceiling Assemblies	2	1½	1	1	0	1	0	H	1	0
Interior Nonbearing Walls	0	0	0	0	0	0	0	0	0	0
Exterior Nonbearing Walls[c]	0[b]	0[b]	0[b]	0[b]	0[b]	0[b]	0[b]	0[b]	0[b]	0[b]

H: heavy timber members *(see text for requirements).*

[a]See *NFPA 5000*, 7.3.2.1.

[b]See *NFPA 5000*, Section 7.3.

[c]See *NFPA 5000*, 7.2.3.2.12, 7.2.4.2.3, and 7.2.5.6.8.

[**5000:** Table 7.2.1.1]

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Table A.7.3 Minimum Areas for Stalls, Cages, and Enclosure Areas

Animal Category	Area Needs		Dimensional Needs		Per Number of Animal	Height of Wall		Additional Note
	ft^2	m^2	ft × ft	m × m		ft	m	
Aardvark	64	5.95	8 × 8	2.4 × 2.4	1			
African Bovids and Chevrotains								
Small and medium sized	25	2.32	5 × 5	1.53 × 1.53	1	8	2.46	
Large	100	9.29	10 × 10	3.05 × 3.05	1	8	2.46	
Agouti and Acouchi	24	2.23	4 × 6	13.1 × 1.83	1	4	1.22	
Antelope and Gazelle								
Antelopes eland, greater kudu, sable, hartebeest	100	9.29			1			Night stall
Antelope most other species	70	6.5			1			Night stall
Antelope bushbuck and sitatunga	45	4.18			1			Night stall
Gazelle (night stall)	56	5.2			1			Night stall
Gazelle (long period)	150	13.94			1			Long stay period
Bats								
Nonflight bat cage								
Bat flight indoor 4 times length wing								
Bears								
Brown bear	36	3.35	6 × 6	1.83 × 1.83	1	5	1.53	
Other bears	25	2.32	5 × 5	1.53 × 1.53	1	5	1.53	
Beaver								
Camelids	300	27.88	15 × 20	4.57 × 6.1	1			
Canids (small)								
One or two animals	42.5	3.95	6.5 × 6.5	1.98 × 1.98	2	5	1.53	
Three animals	100	9.29	10 × 10	3.05 × 3.05	3	5	1.53	
Family group (pair and up to 5 offspring)	169	15.71	13 × 13	3.96 × 3.96	family	5	1.53	
Capybaras	240	22.30	12 × 20	3.66 × 6.1	2			
Cattle (wild)	150	13.94	10 × 15	3.05 × 4.57				Bull: 20 × 20
Cavies and Patagonian Hares	4	0.37	15–20 gal*	0.058–0.07 m^{3*}				
Cervids								
Large cervids (elk, moose)	150	13.94			1			
Mid-sized cervids (white tail deer)	100	9.29			1			
Small cervids (muntjac, musk)	8	0.74	3 × 2.5 × 2.75	0.91 × 0.76 × 0.84	1			Dog house size
Chinchillas and Viscachas	16	1.48	4 × 4	1.22 × 1.22	2	3	0.91	
Elephants	400–600	37.17–55.76			1	>20	>6.1	
Equids	450	41.82	15 × 30	4.57 × 9.15	1	6–8	2.06–2.46	
Felids (large)								
Very large pantherids (lion, tiger)	300	27.88	20 × 15	6.1 × 4.57	1			Outdoor high and/or moat
Other large felids jaguar, leopard, panther	200	18.59			1			
Cheetah	200	18.59			1			
Felids (small)								
<10 kg	42.5	3.95	6.5 × 6.5	1.98 × 1.98	1	8	2.46	
<20 kg	84.5	7.85	13 × 6.5	3.96 × 1.98	1	8	2.46	
Giraffes	225	20.91			1	20	6.1	
Goats and Sheep						8–9	2.46–2.74	

Table A.7.3 *Continued*

Animal Category	Area Needs		Dimensional Needs		Per Number of Animal	Height of Wall		Additional Note
	ft^2	m^2	ft × ft	m × m		ft	m	
Hippopotamus								
Pygmy hippo	120	11.15	10 × 12	3.05 × 3.66	1	5	1.53	Need pool also
Nile hippo	168	15.61	12 × 14	3.66 × 4.25	1	11	3.35	Need pool also
Hutias	49	4.55	7 × 7	2.13 × 2.13	2	7	2.13	
Hyenas and Aardwolves	200	18.59			1			
Hyrax	36	3.46	6 × 6	1.83 × 1.83	2	5 indoor	1.53 indoor	8 ft outdoor
Insectivores	10	0.93	5–55 gal*	0.058–0.21 m^{3*}		Tank*		
Marsupials	43	4.0			2			
Monotremes	9	0.84	3 × 3	0.91 × 0.91	1	5	1.53	
Mustelids			(body size chart)	(body size chart)				
Nonhuman Primates								
Cebidae	107	9.94	13.1 × 8.2	4 × 2.5	5	8.2	2.5	
Cercopithecinae	100	9.29	10 × 10	3.05 × 3.05	2	8	2.46	
Cheirogaleidae	16	1.49	4 × 4	1.22 × 1.22	2	4	1.22	
Colobinae	225	20.91	15 × 15	4.57 × 4.57	3	15	4.57	
Daubentonidae	129	12.0	13.1 × 9.8	4 × 3	2	9.9	3	
Hylobatidae	63	5.86	7 × 9	2.13 × 2.74	1	7	2.13	
Indriidae	269	25.0	16.5 × 16.5	5 × 5	2	16.5	5	
Lemuridae	25	2.32	5 × 5	1.52 × 1.52	2	6	1.83	
Lorisidae	97	9.01	9.9 × 9.9	3 × 3	2	9.9	3	
Marmosets, tamarins, and callimico	32	2.97	4 × 8	1.22 × 2.46	group	8	2.46	
Pongidae	196	18.21	14 × 14	4.27 × 4.27	1	10	3.5	
Tarsiidae	10.75	1.0	3.3 × 3.3	1 × 1	2	6.6	2	
Okapis	300	27.88	15 × 20	4.57 × 6.1	1	8	2.46	
Pacaranas	96	8.92						Rodent
Pangolins	100	9.29	10 × 10 × 10*	3.05 × 3.05 × 3.05*	2	10	3.5	
Porcupines	36	3.35	6 × 6	1.83 × 1.83	1	5	1.53	
Procyonids and Red Pandas	400	37.17			1	12	3.66	
Pronghorns	30	2.79			1	8	2.46	
Rhinoceros	1500	139.41			1	5	1.53	Moat
Sciurids	16	1.49	4 × 4 × 4*	1.22 × 1.22 × 1.22*	2	Cage	Cage	
Tapirs	100	9.29			1	6	1.83	
Viverrids and Mongooses	64	5.95			2	7	2.13	
Wild Swine	40–60	3.72–5.58			1	5	1.53	

*Volume specified.