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1. INTRODUCTION

In this edition appendix material appears in the main body of the
document; however, it remains advisory only.

1.1 General

The care environment is constituted by those features in a built health care entity that are created, structured, and maintained to support quality health care. As patients and their families have become more involved in the course of care, facilities need to respond to the changing requirements for accommodations. The health care environment should enhance the dignity of the patient through features that permit privacy and confidentiality.

Stress can be a major detriment to the course of a patient's care. The facility should be designed to reduce patient, family, and staff stress wherever possible. Research- and evidence-based materials are available to support these goals and should be referred to during design.

As technology changes, flexibility is in the best interests of quality care. As health care economics apply pressure to management, design should make every effort to enhance the performance, productivity, and satisfaction of the staff in order to promote a safe environment of care. Creativity should be encouraged in the design process to enhance the environment of care.

1.1.A.

This document contains information intended as minimum standards for constructing and equipping new health care facility projects. For brevity and convenience these standards are presented in "code language." Use of words such as *shall* is mandatory only where applied by an adopting authority having jurisdiction. Insofar as practical, these standards relate to desired performance or results or both. Details of construction and engineering are assumed to be part of good design practice and local building regulations. Design and construction shall conform to the requirements of these Guidelines. Requirements set forth in these Guidelines shall be considered as minimum. For aspects of design and construction not included in these Guidelines, local governing building codes shall apply. Where there is no local governing building code, the prevailing model code used within the geographic area is hereby specified for all requirements not otherwise specified in these Guidelines. (See Section 1.54 for wind and seismic local requirements.)

Where ASCE 7-93 is referenced, similar provisions in the model building code are considered substantially equivalent.

An asterisk (*) preceding a paragraph number indicates that explanatory or educational material can be found in Appendix material found at the bottom of the page.

1.1.B.

This document covers health facilities common to communities in ~~this country~~the United States. Facilities with unique services will require special consideration. However, sections herein may be applicable for parts of any facility and may be used where appropriate.

1.1.C.

These Guidelines are not intended to restrict innovations and improvements in design or construction techniques. Accordingly, authorities adopting these standards as codes may approve plans and specifications that contain deviations if it is determined that the respective intent or objective has been met.

Final implementation may be subject to requirements of the authority having jurisdiction.

1.1.D.
Some projects may be subject to the regulations of several different programs, including those of state, local, and federal authorities. While every effort has been made for coordination, individual project requirements should be verified, as appropriate. Should requirements be conflicting or contradictory, the authority having primary responsibility for resolution should be consulted.

1.1.E.
The ~~Health Care Financing Administration~~Centers for Medicare and Medicaid Services, which is responsible for Medicare and Medicaid reimbursement, has adopted the National Fire Protection Association 101 Life Safety Code (NFPA 101). Facilities participating in Medicare and Medicaid programs shall comply with that code.

1.1.F.
The health care provider shall supply for each project a functional program for the facility that describes the purpose of the project, the projected demand or utilization, staffing patterns, departmental relationships, space requirements, and other basic information relating to fulfillment of the institution's objectives. The functional program shall include a description of those services necessary for the complete operation of the facility. The program shall address the size and function of each space and any special design features. Include the projected occupant load, numbers of staff, patients, residents, visitors, and vendors. In treatment areas, describe the types and projected numbers of procedures. Describe the circulation patterns for staff, patients or residents, and the public. Describe also the circulation patterns for equipment and clean and soiled materials. Address equipment requirements; describe building service equipment and fixed and movable equipment. Where the circulation patterns are a function of asepsis control requirements, note these features. The program shall use the same names for spaces and departments as used in the Guidelines. If acronyms are used, they shall be clearly defined. The functional program shall address the potential future expansion that may be needed to accommodate increased demand. The approved functional program shall be made available for use in the development of project design and construction documents. The functional program shall be retained by the facility with the other design data to facilitate future alterations, additions, and program changes.

1.2 Interpretations of Requirements
Although the ultimate interpretation of information contained in this document is the responsibility of the adopting authority having jurisdiction, where applicable, the value of advisory commentary has been recognized. The interpretation of a specific standard contained in these Guidelines may be requested from the Guidelines Steering Committee with a detailed request. The resulting interpretation is intended to provide clarification, a summary of any background and previous discussion if appropriate, and a rationale for the interpretation rendered. It is understood that any such interpretation is advisory in nature, intended to assist the user and adopting authority having jurisdiction to maximize the value of these Guidelines. Requests for interpretation should be submitted to the Steering Committee through the American Institute of Architects, using the form at the back of the book, or by including the information requested on the form in an e-mail message to *healthcareguidelines@aia.org*.

1.3 Renovation

1.3.A.
Where renovation or replacement work is done within an existing facility, all new work or additions, or both, shall comply, insofar as practical, with applicable sections of these Guidelines and with appropriate

parts of NFPA 101, covering New Health Care Occupancies. Where major structural elements make total compliance impractical or impossible, exceptions should be considered. This does not guarantee that an exception will be granted, but does attempt to minimize restrictions on those improvements where total compliance would not substantially improve safety, but would create an unreasonable hardship. These standards should not be construed as prohibiting a single phase of improvement. (For example, a facility may plan to replace a flammable ceiling with noncombustible material but lack funds to do other corrective work.) However, they are not intended as an encouragement to ignore deficiencies when resources are available to correct life-threatening problems. (See Section 1.6.C.)

1.3.B.
When construction is complete, the facility shall satisfy functional requirements for the appropriate classification (general hospital, skilled nursing facility, etc.) in an environment that will provide acceptable care and safety to all occupants.

1.3.C.
In renovation projects and those making additions to existing facilities, only that portion of the total facility affected by the project shall comply with applicable sections of the Guidelines and with appropriate parts of NFPA 101 covering New Health Care Occupancies.

1.3.D.
Those existing portions of the facility that are not included in the renovation but that are essential to the functioning of the complete facility, as well as existing building areas that receive less than substantial amounts of new work, shall, at a minimum, comply with that section of NFPA 101 for Existing Health Care Occupancies.

1.3.E.
Conversion to other appropriate use or replacement should be considered when cost prohibits compliance with acceptable standards.

1.3.F.
When a building is converted from one occupancy to another, it shall comply with the new occupancy requirements. For purpose of life safety, a conversion from a hospital to a nursing facility or vice versa is not considered a change in occupancy.

1.3.G.
When parts of an existing facility essential to continued overall facility operation cannot comply with particular standards, those standards may be temporarily waived if patient care and safety are not jeopardized.

1.3.H.
Renovations, including new additions, shall not diminish the safety level that existed prior to the start of the work; however, safety in excess of that required for new facilities is not required.

1.3.I.
Nothing in these Guidelines shall be construed as restrictive to a facility that chooses to do work or alterations as part of a phased long-range safety improvement plan. It is emphasized that all hazards to life and safety and all areas of noncompliance with applicable codes and regulations should be corrected as soon as possible in accordance with a plan of correction.

1.4 Design Standards for the Disabled

The Americans with Disabilities Act (ADA) became law in 1990. This law extends comprehensive civil rights protection to individuals with disabilities. Under Titles II and III of the ADA, public, private, and public service hospitals and other health care facilities will need to comply with the *Accessibility Guidelines for Buildings and Facilities* (ADAAG) for alterations and new construction. The *Uniform Federal Accessibility Standards* (UFAS) also provides criteria for the disabled. Implementation of UFAS and ADAAG for federal facilities is handled in the following ways:

- Compliance with UFAS
- Compliance with ADAAG
- Compliance with a combination of UFAS and ADAAG using the most stringent criteria

Individual federal agencies will provide direction on applicable criteria to be used for the design of federal facilities.

Also available for use in providing quality design for the disabled is the American National Standards Institute (ANSI) A117.1 *American National Standard for Accessible and Usable Buildings and Facilities*.

State and local standards for accessibility and usability may be more stringent than ADA, UFAS, or ANSI A117.1. Designers and owners, therefore, must assume responsibility for verification of all applicable requirements.

It shall be recognized, however, that the users of hospitals and health care facilities often have very different accessibility needs from the typical adult individual with disabilities addressed by the model standards and guidelines mentioned above. Hospital patients, and especially nursing facility residents, due to their stature, reach, and strength characteristics, typically require the assistance of caregivers during transfer maneuvers. Many prescriptive requirements of model accessibility standards place both older persons and caregivers at greater risk of injury than do facilities that would be considered noncompliant. Flexibility may be permitted for the use of assistive configurations that provide considerations for transfer assistance.

*1.5 Provisions for Disasters

In locations where there is recognized potential for hurricanes, tornadoes, flooding, earthquake, or other regional disasters, planning and design shall consider the need to protect the life safety of all health care facility occupants and the potential need for continuing services following such a disaster.

When consistent with their functional program and disaster planning, acute care facilities with emergency services can serve as receiving, triage and initial treatment centers in the event of nuclear, biological, or chemical (NBC) exposure. These facilities shall designate specific area(s) for these functions.

*1.5.A. Wind- and Earthquake-Resistant Design for New Buildings

Facilities shall be designed to meet the requirements of the building codes specified in Section 1.1.A provided these requirements are substantially equivalent to ASCE 7-93. Design shall meet the requirements of ASCE 7-93.

The following model codes and provisions are essentially equivalent to the ASCE 7-93 requirements:

- 1988 NEHRP Provisions
- ~~1991 ICBO Uniform Building Code~~
- ~~1992 Supplement to the BOCA National Building Code~~
- ~~1992 Amendments to the SBCC Standard Building Code~~

1.5.A1. For those facilities that must remain operational in the aftermath of a disaster, special design is required to protect systems and essential building services such as power, water, medical gas systems, and, in certain areas, air conditioning. In addition, special consideration must be given to the likelihood of temporary loss of externally supplied power, gas, water, and communications.

1.5.A2. The owner shall provide special inspection during construction of seismic systems described in Section A.9.1.6.2 and testing described in Section A.9.1.6.3 of ASCE 7-93.

1.5.A3. Roof coverings and mechanical equipment shall be securely fastened or ballasted to the supporting roof construction and shall provide weather protection for the building at the roof. Roof covering shall be applied on clean and dry decks in accordance with the manufacturer's instructions, these Guidelines, and related references. In addition to the wind force design and construction requirements specified, particular attention shall be given to roofing, entryways, glazing, and flashing design to minimize uplift, impact damage, and other damage that could seriously impair functioning of the building. If ballast is used it shall be designed so as not to become a projectile.

1.5.B.
Flood Protection, Executive Order No. 11988, was issued to minimize financial loss from flood damage to facilities constructed with federal assistance. In accordance with that order, possible flood effects shall be considered when selecting and developing the site. Insofar as possible, new facilities shall *not* be located on designated floodplains. Where this is unavoidable, consult the Corps of Engineers regional office for the latest applicable regulations pertaining to flood insurance and protection measures that may be required.

1.5.C.
Should normal operations be disrupted, the facility shall provide adequate storage capacity for, or a functional program contingency plan to obtain, the following supplies: food, sterile supplies, pharmacy supplies, linen, and water for sanitation. Such storage capacity or plans shall be sufficient for at least four continuous days of operation.

1.6 National Standards for the Protection of Certain Health Information

The Health Insurance Portability and Accountability Act (HIPAA) became law in 1996. HIPAA consists of three major parts:
- Privacy Rule
- Transaction and Code Sets
- Security Rule

The U.S. Department of Health and Human Services (HHS) issued the Privacy Rule to implement the requirement of HIPAA. Within HHS, the Office of Civil Rights (OCR) has the responsibility for enforcement of the HIPAA regulations. HIPAA does not preempt or override laws that grant individuals even greater privacy protection. Additionally, covered entities are free to retain or adopt more protective policies or practices.

HHS may provide direction and clarification on the Privacy Rule and Security Rule. HIPAA provides for civil and even criminal penalties for violations.

Ultimately, designers and owners must assume responsibility in developing policies and procedures for verification of all applicable requirements that appropriately limit access to personal health information without sacrificing the quality of health care.

1.~~6~~7 Codes and Standards

1.~~6~~7.A.
Every health care facility shall provide and maintain a safe environment for patients, personnel, and the public.

1.~~6~~7.B.
References made in these Guidelines to appropriate model codes and standards do not, generally, duplicate wording of the referenced codes.

NFPA's standards, especially the NFPA 101, are the basic codes of reference; but other codes and/or standards may be included as part of these standards. In the absence of state or local requirements, the project shall comply with approved nationally recognized building codes except as modified in the latest edition of the NFPA 101, and/or herein.

Referenced code material is contained in the issue current at the time of this publication. The latest revision of code material is usually a clarification of intent and/or general improvement in safety concepts and may be used as an explanatory document for earlier code editions. Questions of applicability should be addressed as the need occurs. The actual version of a code adopted by a jurisdiction may be different. Confirm the version adopted in a specific area with the authority having jurisdiction.

***1.~~6~~7.C. Equivalency**
Insofar as practical, these minimum standards have been established to obtain a desired performance result. Prescriptive limitations, when given, such as exact minimum dimensions or quantities, describe a condition that is commonly recognized as a practical standard for normal operation. For example, reference to a room area is for patient, equipment, and staff activities; this avoids the need for complex descriptions of procedures for appropriate functional planning.

National Fire Protection Association (NFPA) document 101A is a technical standard for evaluating equivalency to certain Life Safety Code 101 requirements. The Fire Safety Evaluation System (FSES) has become widely recognized as a method for establishing a safety level equivalent to the Life Safety Code. It may be useful for evaluating *existing* facilities that will be affected by renovation. For purposes of these Guidelines, the FSES is not intended to be used for *new* construction.

1.~~6~~7.D. English/Metric Measurements
Where measurements are a part of this document, English units are given as the basic standards, with

equivalent metric units in parentheses. Either method shall be consistently used throughout a given design.

1.67.E List of Referenced Codes and Standards

Codes and standards that have been referenced in whole or in part in the various sections of this document are listed below. Names and addresses of the originators are also included for information. The issues available at the time of publication are used. Later issues will normally be acceptable where requirements for function and safety are not reduced; however, editions of different dates may have portions renumbered or retitled. Care must be taken to ensure that appropriate sections are used.

Access Board (an independent federal agency). *Uniform Federal Accessibility Standard* (UFAS). (http://www.access-board.gov/ufas/ufas-html/ufas.htm)

American Society of Civil Engineers. ASCE 7-98 (formerly ANSI A58.1). *Minimum Design Loads for Buildings and Other Structures, ASCE 7-98*. (http://www.pubs.asce.org/BOOKdisplay.cgi?9990609)

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). (http://www.ashrae.org)

Standard 52.1-1992, *Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter*.
Standard 52.2, *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.*
Standard 154, *Ventilation for Commerical Cooking Operations.*
Standard 55, *Thermal Environmental Conditions for Human Occupancy.*
Standard 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings.*
ASHRAE Handbook - Fundamentals.
Standard 62-1999, *Ventilation for Acceptable Indoor Air Quality*.
1999 ASHRAE Handbook-HVAC Applications.

American Society of Mechanical Engineers (ASME). (http://www.asme.org/cns/departments/Safety/Public/A17/ or www.ansi.org)

ANSI/ASME A17.1, *Safety Code for Elevators and Escalators*, 1999.
ANSI/ASME A17.3, *Safety Code for Existing Elevators and Escalators*.

American Water Works Association (AWWA) (www.awwa.org)

Recommended Practice for Backflow Prevention and Cross-connection Control, 2004.

Americans with Disabilities Act. U.S. Department of Justice ADA Information Line, 1-800-514-0301 or 1-800-514-0383 (TDD). (http://www.usdoj.gov/disabilities.htm)

Association for the Advancement of Medical Instrumentation. ANSI/AAMI RD5:19926.2, 2001, *Hemodialysis systemsWater Treatment Equipment for Hemodialysis Applications*. (www.aami.org)

Building Officials and Code Administrators International. (www.bocai.org)

The BOCA Basic Building Code. (http://www.bocai.org/order_building_res.htm)
The BOCA Basic Plumbing Code. (http://www.bocai.org/order_plumbing.htm)
The BOCA National Building Code, 1999 (http://www.bocai.org/intcode.htm)

Building Seismic Safety Council (National Institute of Building Sciences). *NEHRP (National Earthquake Hazards Reduction Program) Recommended Provisions for Seismic Regulations for New Buildings*,

1997 ed., and "Proposals for Change to the 1997 *NEHRP Recommended Provisions* for Issuance as the 2000 Provisions." (http://www.bssconline.org)

Centers for Disease Control and Prevention (CDC). (www.cdc.gov)
"Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Facilities, 1994." *Morbidity and Mortality Weekly Report* (*MMWR*) 1994:43 (No. RR-13). (http://www.cdc.gov/~~epo/~~mmwr/preview/mmwrhtml/00035909.htm)
"Guidelines for Prevention of Nosocomial Pneumonia, 1994." *American Journal of Infection Control* (22:247-292) (http://www.cdc.gov/ncidod/diseases/hip/pneumonia/pneu_mmw.htm)

College of American Pathologists. *Medical Laboratory Planning and Design*, 1985. (1-800-323-4040 or www.cap.org)

Compressed Gas Association (CGA). Publication #E-10, *Maintenance of Medical Gas and Vacuum Systems in Health-Care Facilities*, 1997 (http://www.cganet.com/Pubs/CGA_Publications_for_sale.html)

Department of Defense. MIL STD 282, *Filter Units, Protective Clothing, Gas-Mask Components and Related Products: Performance-Test Methods*. (http://astimage.daps.dla.mil/quicksearch/basic_profile.cfm?ident_number=35676)

Food and Drug Administration. *FDA Food Code*, 1999. (http://vm.cfsan.fda.gov/~dms/foodcode.html)

Hydronics Institute Division of the Gas Appliance Manufacturers Association. *I-B-R Ratings for Boilers, Baseboard Radiation and Finned Tube (Commercial)*, January 1, 2000 ed. (http://www.gamanet.org/publist/hydroordr.htm)

Illuminating Engineering Society of North America (IESNA). (http://www.iesna.org)
~~IESNA Publication HB-99, *IESNA Lighting Handbook*, 9th ed.~~
ANSI/IESNA RP-28-01, *Lighting and the Visual Environment for Senior Living.*
IESNA Publication RP-29-95, *Lighting for Hospitals and Health Care Facilities ANSI Approved.*
IESNA Publication RP-28-98, *Lighting and the Visual Environment for Senior Living.*

Industrial Safety Equipment Association (ISEA). (www.ansi.org)
ANSI-Z-358-1998, *Emergency Eyewash and Shower Equipment.*

International Code Council (ICC) (http://www.iccsafe.org)
International Building Code

~~International Conference of Building Officials (ICBO). *1997 Uniform Building Code.* (http://www.icbo.org/wsnsa.dll/prodshow.html?prodid=097S97&stateInfo=kfdtaUCraDxKaifi2857|2)~~

National Council on Radiation Protection and Measurements (NCRP). (http://www.ncrp.com/ncrprpts.html)
Report #49, *Structural Shielding Design and Evaluation for Medical Use of X Rays and Gamma Rays of Energies up to 10 MeV*, 1976.
Report #51, *Radiation Protection Design Guidelines for 0.1-100 MeV Particle Accelerator Facilities*, 1977.
Report #102, *Medical X-Ray, Electron Beam and Gamma-Ray Protection for Energies Up to 50*

MeV (Equipment Design, Performance and Use), 1989.

National Fire Protection Association. (http://www.nfpa.org/Codes/index.html)
NFPA 20, *Standard for the Installation of Stationary Fire Pumps for Fire Protection*, 1999.
NFPA 70, *National Electrical Code Looseleaf*, 1999.
NFPA 80, *Standard for Fire Door, Fire Windows*, 1999.
NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment*, 1999.
NFPA 90A, *Standard for the Installation of Air Conditioning and Ventilating Systems*, 1999.
NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, 1998.
NFPA 99, *Standard for Health Care Facilities*, 1999.
NFPA 101, *Life Safety Code*, 2000.
NFPA 110, *Standard for Emergency and Standby Power Systems*, 1999.
NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source*, 2000.
NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*, 2000.
NFPA 258, *Standard Research Test Method of Determining Smoke Generation of Solid Materials*, 1997.
NFPA 418, *Standard for Heliports*, 1995.
NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, 1999.
NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials,* 1998.

Nuclear Regulatory Commission (NRC). Code of Federal Regulation (CFR) Title 10—Energy, Chapter 1—Nuclear Regulatory Commission (http://www.nrc.gov/NRC/CFR/index.html)
Part 20 (10 CFR 20), Standards for Protection Against Radiation.
Part 35 (10 CFR 35), Medical Use of Byproduct Material.

Occupational Safety and Health Administration, U.S. Department of Labor. Code of Federal Regulations (CFR) Title 29—OSHA Regulations. (www.osha.org)
Part 1910 (29 CFR 1910), Occupational Safety and Health Standards. (http://www.osha-slc.gov/OshStd_toc/OSHA_Std_toc_1910.html)

Plumbing-Heating-Cooling Contractors—National Association (PHCC—National Association). *National Standard Plumbing Code*. (http://www.naphcc.org/)

~~Southern Building Code Congress International. *Standard Building Code—1997-99 Significant Code Changes*. (http://sbcci.org/Codes/codes.htm)~~

1.6.F Referenced Codes and Standards
Some of the codes and standards used in this publication are listed herein. Users of these publications are encouraged to use them for further information as may be necessary to achieve the final product. References to federal publications may be obtained from the Government Printing Office in Washington, D.C.

Air Conditioning and Refrigeration Institute
4301 North Fairfax Drive, Suite 425
Arlington, VA 22203

Tel. 703-524-8800
Web: http://www.ari.org

Architectural and Transportation Barriers Compliance Board
Office of Technical and Information Services
1331 F St., N.W., Suite 1000
Washington, DC 20004-1111
Tel. 202-272-5434, 1-800-872-2253
Web: http://www.access-board.gov

Americans with Disabilities Act
U.S. Department of Justice
950 Pennsylvania Ave., N.W.
Washington, DC 20530-0001
Tel. 1-800-514-0301
Web: http://www.usdoj.gov/crt/ada/adahom1.htm

American National Standards Institute (ANSI)
11 West 42nd Street
New York, NY 10036
Tel. 212-642-4900
Web: http://www.ansi.org

American Society of Heating, Refrigerating and Air-Conditioning Engineers
1791 Tullie Circle, N.E.
Atlanta, GA 30329
Tel. 1-800-527-4723, 404-636-8400
Web: http://www.ashrae.org

American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191-4400
Tel. 1-800-548-2723, 703-295-6300
Web: http://www.asce.org

American Society of Mechanical Engineers (ASME)
Three Park Avenue
New York, NY 10016-5990
Tel. 1-800-THE-ASME
Web: http://www.asme.org

American Society for Testing and Materials
100 Barr Harbor Drive
West Conshocken, PA 19428-2959
Tel. 610-832-9585
Web: http://www.astm.org

Association for the Advancement of Medical Instrumentation
1110 N. Glebe Road, Suite 220

Arlington, VA 22201-5762
Tel. 1-800-332-2264, 703-525-4890
Web: http://www.aami.org

~~Building Officials and Code Administrators International, Inc. (BOCA)~~
~~4051 Flossmoor Road~~
~~Country Club Hills, IL 60478-5795~~
~~Tel. 708-799-2300~~
~~Web: http://www.bocai.org~~

Building Seismic Safety Council
National Institute of Building Sciences
1090 Vermont Avenue, N.W., Suite 700
Washington, DC 20005-4905
Tel. 202-289-7800
Web: http://www.bssconline.org

Centers for Disease Control and Prevention
Hospital Infection Control Practices (HICPAC)
Center for Infection Control
1600 Clifton Road
Atlanta, GA 30333
Tel. 404-639-3311, 1-800-311-3435
Web: http://www.cdc.gov

College of American Pathologists
325 Waukegan Road
Northfield, IL 60093
Tel. 1-800-323-4040, 847-832-7000 (in IL)
Web: http://www.cap.org

Compressed Gas Association
1725 Jefferson Davis Highway, Suite 1004
Arlington, VA 22202
Tel. 703-412-0900
Web: http://www.cganet.com

Food and Drug Administration (FDA)
Center for Food Safety and Applied Nutrition
200 C Street, S.W.
Washington, DC 20204
Tel. 1-888-463-6332
Web: http://vm.cfsan.fda.gov

General Services Administration
National Capital Region
7th and D Streets, S.W.
Washington, DC 20407
Web: http://www.gsa.gov

Hydronics Institute (Division of Gas Appliance Manufacturer Association (GAMA))
35 Russo Place, P.O. Box 218
Berkeley Heights, NJ 07922
Tel. 908-464-8200Web: http://www.gamanet.org

Illuminating Engineering Society of North America (IESNA)
120 Wall Street, Floor 17
New York, NY 10005
Tel. 212-248-5000
Web: http://www.iesna.org

International Code Council
5203 Leesburg Pike, Suite 600
Falls Church, VA 22041-3401
Tel. 703-931-4533
Web: http://www.intlcode.org

~~International Conference of Building Officials (ICBO)~~
~~5360 Workman Mill Road~~
~~Whittier, CA 90601-2298~~
~~Tel. 1-800-423-6587 ext 3278 (bldg stndrds)~~
~~Web: http://www.icbo.org~~

National Council on Radiation Protection and Measurement
7910 Woodmont Avenue, Suite 800
Bethesda, MD 20814-3095
Tel. 301-657-2652
Web: http://www.ncrp.com

National Fire Protection Association (NFPA)
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
Tel. 617-770-3000
Web: http://www.nfpa.org

National Institute of Standards and Technology
(formerly National Bureau of Standards)
100 Bureau Dr., Stop 3460
Gaithersburg, MD 20899-3460
Tel. 301-975-6478
Web: http://www.nist.gov

National Technical Information Service (NTIS)
U.S. Department of Commerce Technology Administration
5285 Port Royal Road
Springfield, VA 22161
Tel. 703-605-6000, 703-487-4600

Web: http://www.ntis.gov

Department of Defense Single Stock Point~~Naval Publications and Form Center~~
~~5801 Tabor Avenue~~
~~Philadelphia, PA 19120~~
Building 4, Section D
700 Robbins Avenue
Philadelphia, PA 19111-5098
(DOD~~P~~ Penetration Test Method, MIL-STD-282)
http://dodssp.daps.dla.mil/~~Web: http://astimage.daps.dla.mil/wizard (go to "registration")~~

Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738
Tel. 301-415-7000
Web: http://www.nrc.gov

Occupational Safety & Health Administration
U.S. Department of Labor
200 Constitution Avenue, N.W., Room N3647
Washington, DC 20210
Tel. 202-693-1999
Web: http://www.osha.gov

Plumbing-Heating-Cooling Contractors—National Association
180 South Washington Street, P.O. Box 6808
Falls Church, VA 22046
Tel. 1-800-533-7694
Web: http://www.naphcc.org

~~Southern Building Code Congress International, Inc.~~
~~900 Montclair Road~~
~~Birmingham, AL 35213-1206~~
~~Tel. 205-591-1853~~
~~Web: http://www.sbcci.org~~

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062-2096
Tel. 847-272-8800
Web: http://www.ul.com

A1.5
Owners of existing facilities should undertake an assessment of their facility with respect to its ability to withstand the effects of regional natural disasters. The assessment should consider performance of structural and critical nonstructural building systems and the likelihood of loss of externally supplied power, gas, water, and communications under such conditions. Facility master planning should consider mitigation measures required to address conditions that may be hazardous to patients and conditions that may compromise the ability of the facility to fulfill its planned post-emergency medical response. Particular attention should be paid to seismic considerations in areas where the effective peak acceleration coefficient, Aa, of ASCE 7-93 exceeds 0.15.

Infection and Biohazard Control
Facilities may designate an outdoor parking lot adjacent to the emergency department to serve as a primary decontamination area, which should include appropriate plumbing fixtures (e.g., hot and cold water) and drainage. Utilization of screens and tents may be needed. Other contingencies may require airborne infection isolation, application and removal of therapeutic chemical substances, and temporary container storage of contaminated materials. Handwashing and shower capabilities will usually be of paramount importance in biohazard control efforts.

A1.5.A.
The ASCE 7-93 seismic provisions are based on the National Earthquake Hazards Reduction Program (NEHRP) provisions (1988 edition.) developed by the Building Seismic Safety Council (BSSC) for the Federal Emergency Management Agency (FEMA).

A study by the National Institute of Standards and Technology (NIST) found that the following seismic standards were essentially equivalent to the NEHRP (1988) provisions:

- 1991 ICBO Uniform Building Code
- 1992 Supplement to the BOCA National Building Code
- 1992 Amendments to the SBCC Standard Building Code

Executive Order 12699, dated January 5, 1990, specified the use of the maps in the most recent edition of ANSI A58 for seismic safety of federal and federally assisted or regulated new building construction. The ASCF 7 standard was formerly the ANSI A58 standard. Public Law 101-614 charged FEMA to "prepare and disseminate widely…information on building codes and practices for buildings.…" The NEHRP provisions were developed to provide this guidance.

A1.~~6~~7.C. Equivalency
While this document is adopted as a regulatory standard by many jurisdictions, it is the intent of the document to permit and promote equivalency concepts. When contemplating equivalency allowances, the authority having jurisdiction may use a variety of expert sources to make equivalency findings and may document the reasons for approval or denial of equivalency to the requestor. Alternate methods, procedures, design criteria, and functional variations from the Guidelines, because of extraordinary circumstances, new programs, or unusual conditions, may be approved by the authority having jurisdiction when the facility can effectively demonstrate that the intent of the Guidelines is met and that the variation does not reduce the safety or operational effectiveness of the facility below that required by the exact language of the Guidelines.

In all cases where specific limits are described, equivalent solutions will be acceptable if the authority having jurisdiction approves them as meeting the intent of these standards. *Nothing in this document shall be construed as restricting innovations that provide an equivalent level of performance with these standards in a manner other than that which is prescribed by this document, provided that no other safety element or system is compromised in order to establish equivalency.*

*2. ENVIRONMENT OF CARE

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

~~2.1 Energy and Other Resource Conservation~~

~~The importance of energy conservation shall be considered in all phases of facility development or renovation. Proper planning and selection of mechanical and electrical systems, as well as efficient utilization of space and climatic characteristics, can significantly reduce overall energy consumption. The quality of the health care facility environment must, however, be supportive of the occupants and functions served. Design for energy conservation shall not adversely affect patient health, safety, or accepted personal comfort levels. New and innovative systems that accommodate these considerations while preserving cost effectiveness are encouraged. Architectural elements that reduce energy consumption shall be considered part of facilities design.~~

~~**A2.**~~
~~For access to research on the effects of the built environment on health outcomes and related information, contact the Center for Health Design at 3470 Mt. Diablo Boulevard, Suite A-150, Lafayette, CA 94549; (925) 299-3631, or view the Center's Web site at www.healthdesign.org.~~

2.1 General

The built environment has a profound impact on health, productivity, and our natural environment. Health care facilities shall be designed within a framework that recognizes the primary mission of health care (including "first, do no harm") and considers the larger context of enhanced patient environment, employee effectiveness, and resource stewardship.

The goal of the Environment of Care chapter is to identify overall components and specific key elements that directly affect the experience in the health care delivery system. These components and key elements influence patient outcomes and satisfaction, dignity, privacy, confidentiality, safety, medical errors, stress, and impact operations.

While the environment of care is the focus of this chapter, it is also an element of individual chapters where the demonstrated value and necessity of such features are identified and unique to individual requirements.

2.1.A. Functional Program

The health care provider shall supply for each project a functional program for the facility that describes the purpose of the project, the projected demand or utilization, staffing patterns, departmental relationships, space requirements, environment of care components, key elements, and other basic information related to fulfillment of the institution's objectives.

The functional program shall include a description of those services necessary for the complete operation of the facility.

The program shall address the size and function of each space and any other design feature. Include the projected occupant load, numbers and type of staff, patients, residents, visitors and vendors. In treatment areas, describe the types and projected numbers of procedures.

Describe the circulation patterns for staff, patients or residents, and the public. Describe also the circulation patterns for equipment and clean and soiled materials. Address equipment requirements; describe building service equipment and fixed and moveable equipment. Where circulation patterns are a function of asepsis control requirements, note these features.

The program shall use the same names for spaces and departments as used in the Guidelines. If acronyms are used, they shall be clearly defined.

The functional program shall address potential future expansion that may be needed to accommodate increased demand.

The approved functional program shall be made available for use in the development of project design and construction documents.

The functional program shall be retained by the facility with other design data to facilitate future alterations, additions, and program changes.

2.2 Components of the Functional Program

The following environment of care components and key elements shall be included in the functional program:

*2.2.A. Delivery of Care Model (Concepts)

The delivery of care model shall be defined in the functional program. The functional program shall support the delivery of care model to allow the design of the physical environment to respond appropriately.

*2.2.B. Facility and Service Users (People)

The physical environment shall support the facility and service users in their effort to administer the delivery of care model.

*2.2.C. Systems

The physical environment shall support organizational, technological, and building systems designed for the intended delivery of care model.

*2.2.D. Layouts/Operational Planning

The design of the physical environment shall enhance patient/family and staff satisfaction and operational efficiencies

2.2.E. Physical Environment

The physical environment shall be designed to support the intended delivery of care model and address the key elements listed below.

*2.2.E1. Light and views. Use and availability of natural light, illumination, and views shall be considered in the design of the physical environment.

*2.2.E2. Clarity of access (wayfinding). Clarity of access shall be addressed in the overall planning of the facility, individual departments, and clinical areas.

*2.2.E3. Control of environment. Patient/resident/staff ability to control their environment shall be addressed in the overall planning of the facility consistent with the functional program.

*2.2.E4. Privacy/confidentiality. Patient/resident level of privacy/confidentiality shall be addressed in the overall planning of the facility consistent with the functional program.

*2.2.E5. Safety/security. Patient/resident/staff/visitor safety and security shall be addressed in the overall planning of the facility consistent with the functional program.

*2.2.E6. Finishes. The effect on patients/residents/staff/visitors of materials, colors, textures, and patterns shall be considered in the overall planning and design of the facility. Maintenance and performance shall be considered when selecting these items.

*2.2.E7. Cultural responsiveness. The culture of patients/residents/staff/visitors shall be considered in the overall planning of the facility.

*2.2E8. Water features. Where provided, open water features shall be equipped to safely treat water and protect occupants from infectious or irritating aerosols.

***2.2.F. Design Process and Implementation**

Groups (stakeholders) affected by and integral to the design shall be included in the planning and implementation process.

*2.3 Sustainable Design

Sustainable design, construction, and maintenance practices to improve building performance shall be considered in the design and renovation of health care facilities.

***2.3.A. Components**

The basic components of sustainable design are:

*2.3.A1. Site selection and development. Design to minimize negative environmental impacts associated with buildings and related site development.

2.3.A2 Waste minimization. Design to support the minimization of waste in construction and operation.

2.3.A3 Water quality and conservation. Evaluate potable water quality and conservation in all phases of facility development or renovation. Design for water conservation shall not adversely affect patient health, safety, or infection control.

2.3.A4 Energy conservation. Consider energy conservation in all phases of facility development or renovation. Proper planning and selection of mechanical and electrical systems, as well as efficient utilization of space and climatic characteristics, can significantly reduce overall energy demand and consumption. The quality of the health care facility environment must, however, be supportive of the occupants and function served. Design for energy conservation shall not adversely affect patient health, safety, or accepted personal comfort levels. Architectural elements that reduce energy consumption shall be considered part of facilities design.

2.3.A5. Indoor air quality. The impact of building design and construction on indoor air quality shall be addressed. Minimize impact from both exterior and interior air-contamination sources.

2.3.A6. Impact of selected building materials. Address the environmental impacts associated with the life cycle of building materials.

*2.3.B. Waste Reduction

*2.3.C. Water Conservation

*2.3.D. Energy Conservation

*2.3.E. Indoor Air Quality

*2.3.F. Impact of Selected Building Materials

A2.2.A Delivery of Care Model (Concepts)
Examples of delivery of care models include Patient Focused Care, Family Centered Care, Community Centered Care.

A2.2.B. Facility and Service Users (People)

A2.2.C. Systems
Physical relationships between services or new aggregation of services should be clearly defined and supported. Clustering of related services affects the criteria for design of the physical environment. Information technology, medical technology, and/or staff utilization and cross training are issues that should be addressed.

A2.2.D. Layouts/Operational Planning
Criteria for evaluation of the layouts should be consistent with the delivery of care model to allow each optional layout and operational plan to be reviewed appropriately.

A2.2.E1. Light and views. The quality of artificial and natural light, as well as an awareness of the exterior environment, can all have an impact on clinical outcomes, staff productivity, and the level of stress.

a. Maximize natural light, views, and access to the outdoors, as appropriate.

(1) Access to natural light should be-achieved without going into private spaces (i.e., staff should not have to enter a patient/resident room to have access to natural light). Examples include windows at the ends of corridors, skylights into deep areas of the building in highly trafficked areas, transoms, and door sidelights.

(2) Hospitals and long term care facilities should provide a garden or other controlled exterior space, accessible to building occupants.

(3) Siting and organization of the building should respond to and prioritize unique natural views and other natural site features.

b. Artificial lighting strategies. The Illuminating Engineering Society of North America (IESNA) recommends solutions in health facilities. Details can be found in IESNA RP-29-95, Recommended Practice: Lighting for Hospitals and Health Care Facilities. Lamp selection should address color rendering properties.

A.2.2.E2. Clarity of access (wayfinding)

a. Entry points to the medical facility should be clearly defined from all major exterior circulation modes (roadways, bus stops, vehicular parking).

b. Clearly visible and understandable signage and visual landmarks for orientation should be provided.

c. Boundaries between public and private areas should be well marked, and clearly distinguished.

d. A system of interior "landmarks" should be developed to aid occupants in cognitive understanding of destinations. These may include water features, major art, distinctive color, or decorative treatments at major decision points in the building. These features should attempt to involve tactile, auditory and language cues, as well as visual recognition.

e. Signage systems should be flexible, expandable, adaptable, and easy to maintain.

A2.2.E3. Control of environment

a. Every effort should be made to allow individual control over as many elements of the environment as possible and reasonable, including but not limited to temperature, lighting, and privacy.

b. Lighting in patient and staff areas should allow for individual control and provide variety in lighting types and levels.

c. Building design should address individual control over the thermal environment, through carefully considered zoning of mechanical systems.

A2.2.E4. Privacy/confidentiality

a. Private alcoves or rooms should be provided for all communication concerning personal information relative to patient illness, care plans, insurance and financial matters.

b. Waiting areas for patients on stretchers or in gowns should be located in a private zone within the plan, out of view of the public circulation system.

c. In facilities with multi-bed rooms, family consult rooms, grieving rooms, and/or private alcoves in addition to family lounges should be provided to permit patients and families to communicate privately.

A2.2.E5. Safety and security

a. Attention should be given to balancing readily accessible and visible external access points to the facility with the ability to control and secure all access points in the event of an emergency. Factors such as adequate exterior lighting in parking lots and entry points to the facility, and appropriate reception/security services are essential to ensuring a safe environment.

b. Since the strict control of access to a medical facility is neither possible nor appropriate, safety within the facility should also be addressed through the design of circulation paths and functional relationships. Provisions for securing the personal belongings of staff, visitors, and patients/residents should be addressed.

c. The physical environment should be designed to support the overall safety and security policies and protocols of the institution. Safety and security monitoring, when provided, should respect patient privacy and dignity.

A2.2.E6. Finishes

a. In any design project, the selection of a color palette should be based upon many factors, including the building population, anticipated behavior in the space, time of encounter and level of stress. The color palette selected should be suitable and appropriate for the specific environment, taking into account the specific activities conducted in that environment.

b. Finishes and color palettes should respond to the geographic location of the health care facility, taking into account climate and light, regional responses to color, and the cultural characteristics of the community served.

A2.2.E7. Cultural responsiveness

a. Organizational culture is defined by the history of the organization, leadership philosophy, management style, and care givers disposition.

b. Regional culture is defined by the physical location and demographics, including age, nationality, religion, and economics of the communities served.

A2.2.E8. Water features. Open decorative water features such as fountains may represent a reservoir for opportunistic human pathogens; thus they are not recommended for installation within any enclosed spaces of health care environments. The design should limit contact with the water by enclosing the water feature. The basin should be designed to be resistant to chemical corrosion with minimal droplet production. Exhaust ventilation should be provided directly above the water feature.

A2.2.F. Design Process and Implementation

An interdisciplinary design team should be assembled as early as possible in the design process. The design team should include but not be limited to administrators, clinicians, infection control, safety officers, support staff, patient advocates/consumers, A/E consultants, and construction specialists.

A2.3 Sustainable Design

A growing body of knowledge is available to assist design professionals and health care organizations in understanding how buildings affect human health, how they affect the environment, and how these effects can be mitigated through a variety of strategies. Sustainable design and development tools such as the U.S. Green Building Council's LEED Green Building Rating System and Green Guidelines for Health Care Construction have established a strong framework for design of sustainable buildings. These rating systems establish "best practice" criteria for site design, water and energy usage, materials, and indoor environmental quality.

To meet these objectives, health care organizations should develop an integrated design process to guide facility design. The intent of an integrated design process is to improve building performance by integrating design elements from project inception.

A2.3A Site Development Impacts

Site development impacts encompass land use, storm water management, habitat preservation, landscape design and irrigation systems, and heat island impacts.

A2.3B Waste Reduction

A 1998 memorandum of understanding between the EPA and the AHA targeted a 33 percent reduction in solid waste by 2005, 50 percent by 2010. As hospitals develop environmental preferable purchasing standards and implement significant recycling programs to achieve this goal, facilities should consider the space needs associated with these activities.

A2.3C Water Conservation

Potable water consumption reductions may be achieved through the use of low consumption fixtures and controls, landscape design (xeriscaping) and irrigation systems, and replacement of potable water sources

for items such as water-cooled pumps and compressors, with non-potable sources or non-evaporative heat rejection equipment (air cooled or ground source).

A2.3.D. Energy Conservation
Health care facilities should consider strategies including but not limited to the following examples. On major new projects, consider the use of computer modeling to assist in developing and assessing energy conservation strategies and opportunities.

Reduce overall energy demand. Examples of strategies include high-efficiency building envelope; low-energy sources of lighting (including use of daylighting); advanced lighting controls; use of high-efficiency equipment, both as part of building mechanical/electrical systems (chillers, air handlers) and for plug loads (EnergyStar copiers, computers, medical equipment).

Optimize energy efficiency. Mechanical/electrical control systems should optimize consumption to the minimum actual needs of the building. Consider co-generation systems for converting natural gas to both heat (or cooling) and electricity. Select equipment with improved energy efficiency ratings.

Reduce environmental impacts associated with combustion of fossil fuels and refrigerant selection. Consider various renewable sources of energy generation, including purchase of green power, solar and wind energy, or geothermal/ground source heat pumps

A2.3.E Indoor Air Quality
Carpeting, upholstery, "wet" building products, and manufactured wood products may emit volatile organic compounds (VOCs), including formaldehyde and benzene. Substitute low or zero VOC paints, stains, adhesives, sealants, and other construction materials where practical, and phase out building products containing formaldehyde and other known carcinogens and irritants.

Specify permeable wall covering, mold-resistant drywall, and other materials to prevent trapping moisture and promoting bacteria growth.

High-volume photocopiers, portable sterilizing equipment, and aerosolized medications have been identified as important sources of indoor air pollution in health care settings. Segregate exhaust ventilation for all specialty areas such as housekeeping, copying rooms, sterilization areas, etc., in which such chemical use occurs.

A2.3.F Impact of Selected Building Materials
Increase use of recycled content and recyclable materials in buildings, which have a known destination at the end of their useful life other than landfills.

Building materials and products can impact the global environment. CFCs and persistent bioaccumulative toxics (PBTs) are examples of chemicals that have been the target of international, national, and local environmental elimination initiatives. Reduce or eliminate the use of building materials that generate or utilize PBTs in their life cycle where cost effective alternatives that meet or exceed required performance standards are available. Chemicals commonly addressed in PBT elimination policies that have direct links with building materials include cadmium, lead, mercury, dioxins, and PCBs (polychlorinated biphenyls), either used as an additive in building materials or unavoidably produced and released into the environment during the life cycle of the material.

3. SITE

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

3.1 Location

3.1.A. Access

The site of any health care facility shall be convenient both to the community and to service vehicles, including fire protection apparatus, etc.

*3.1.B. Availability of Transportation

Establish a transportation plan. Support alternatives to fossil fueled single occupancy vehicles, including preferred van/ carpool parking, bike parking and changing facilities, electric car charging and other alternative vehicle fueling stations, nearby transit access.

3.1.C. Security

Health facilities shall have security measures for patients, families, personnel, and the public consistent with the conditions and risks inherent in the location of the facility.

3.1.D. Availability of Utilities

Facilities shall be located to provide reliable utilities (water, gas, sewer, electricity). The water supply shall have the capacity to provide normal usage plus fire-fighting requirements. The electricity shall be of stable voltage and frequency.

3.2 Facility Site Design

3.2.A. Roads

Paved roads shall be provided within the property for access to all entrances and to loading and unloading docks (for delivery trucks). Hospitals with an organized emergency service shall have the emergency access well marked to facilitate entry from the public roads or streets serving the site. Other vehicular or pedestrian traffic should not conflict with access to the emergency station. In addition, access to emergency services shall be located to incur minimal damage from floods and other natural disasters. Paved walkways shall be provided for pedestrian traffic.

3.2.B. Parking

Parking shall be made available for patients, families, personnel, and the public, as described in the individual sections for specific facility types. Signage shall be provided to direct people unfamiliar with the facility to appropriate parking areas.

3.3 Environmental Pollution Control

3.3.A. Environmental Pollution

The design, construction, renovation, expansion, equipment, and operation of hospitals and medical facilities are all subject to provisions of several federal environmental pollution control laws and associated agency regulations. Moreover, many states have enacted substantially equivalent or more stringent statutes and regulations, thereby implementing national priorities under local jurisdiction while additionally incorporating local priorities (e.g., air quality related to incinerators and gas sterilizers; underground storage tanks; hazardous materials and wastes storage, handling, and disposal; storm water control; medical waste

storage and disposal; and asbestos in building materials.)

The principal federal environmental statutes under which hospitals and medical facilities may be regulated include, most notably, the following:

- National Environmental Policy Act (NEPA)
- Resource Conservation and Recovery Act (RCRA)
- Superfund Amendments and Reauthorization Act (SARA)
- Clean Air Act (CAA)
- Safe Drinking Water Act (SDWA)
- Occupational Safety and Health Act (OSHA)

Consult the appropriate U.S. Department of Health and Human Services (DHHS) and U.S. Environmental Protection Agency (EPA) regional offices and any other federal, state, or local authorities having jurisdiction for the latest applicable state and local regulations pertaining to environmental pollution that may affect the design, construction, or operation of the facility, including the management of industrial chemicals, pharmaceuticals, radionuclides, and wastes thereof, as well as trash, noise, and traffic (including air traffic).

Hospital and medical facilities regulated under federal, state, and local environmental pollution laws may be required to support permit applications with appropriate documentation of proposed impacts and mitigations. Such documentation is typically reported in an Environmental Impact Statement (EIS) with respect to potential impacts on the environment and in a Health Risk Assessment (HRA) with respect to potential impacts on public health. The HRA may constitute a part or appendix of the EIS. The scope of the EIS and HRA is typically determined via consultation with appropriate regulatory agency personnel and, if required, via a "scoping" meeting at which members of the interested public are invited to express their particular concerns.

Once the EIS and/or HRA scope is established, a *Protocol* document shall be prepared for agency approval. The *Protocol* shall describe the scope and procedures to be used to conduct the assessment(s). The EIS and/or HRA shall then be prepared in accordance with a final *Protocol* approved by the appropriate agency or agencies. Approval is most likely to be obtained in a timely manner and with minimum revisions if standard methods are initially proposed for use in the EIS and/or HRA. Standard methods suitable for specific assessment tasks are set forth in particular EPA documents.

***3.3.B. Equipment**

~~Equipment should minimize the release of chlorofluorocarbons (CFCs) and any potentially toxic substances that may be used in their place. For example, the design of air conditioning systems should specify CFC alternatives and recovery systems as may be practicable.~~

3.3.C. Mercury Elimination

Hospitals shall phase out the use of mercury-containing equipment, including thermostats, switching devices, and other building system elements. Hospitals shall continue to upgrade to low mercury fluorescent lamp technology. For all mercury-containing devices, hospitals shall develop protocols for collection and recycling.

3.3C.1. Many states and municipalities have enacted bans on sale of mercury containing devices and equipment. Comply with local codes and standards.

A3.1.B. Availability of Transportation
Facilities should be located so they are convenient to public transportation where available, unless acceptable alternate methods of transportation to public facilities and services are provided.

A3.3.B. Equipment should minimize the release of chlorofluorocarbons (CFCs) and any potentially toxic substances that may be used in their place. For example, the design of air conditioning systems should specify CFC alternatives and recovery systems as may be practicable.

4. EQUIPMENT

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

4.1 General

4.1.A.
An equipment list showing all items of equipment necessary to operate the facility shall be included in the contract documents. This list will assist in the overall coordination of the acquisition, installation, and relocation of equipment. The equipment list should include the classifications identified in Section 4.2 below and whether the items are new, existing to be relocated, owner provided, or not-in-contract.

***4.1.B.**
The drawings shall indicate provisions for the installation of equipment that requires dedicated building services or special structures or that illustrate a major function of the space. Adjustments shall be made to the construction documents when final selections are made.

4.1.C.
Space for accessing and servicing fixed and building service equipment shall be provided.

4.1.D.
Some equipment may not be included in the construction contract but may require coordination during construction. Such equipment shall be shown in the construction documents as owner-provided or not-in-contract for purposes of coordination.

4.2 Classification

Equipment will vary to suit individual construction projects and therefore will require careful planning. Equipment to be used in projects shall be classified as building service equipment, fixed equipment, or movable equipment.

4.2.A. Building Service Equipment
Building service equipment shall include such items as heating, air conditioning, ventilation, humidification, filtration, chillers, electrical power distribution, emergency power generation, energy/utility management systems, conveying systems, and other equipment with a primary function of building service.

4.2.B. Fixed Equipment (Medical and Nonmedical)

4.2.B1. Fixed equipment includes items that are permanently affixed to the building or permanently connected to a service distribution system that is designed and installed for the specific use of the equipment. Fixed equipment may require special structural designs, electromechanical requirements, or other considerations.

a. Fixed medical equipment includes, but is not limited to, such items as fume hoods, sterilizers, communication systems, built-in casework, imaging equipment, radiotherapy equipment, lithotripters, hydrotherapy tanks, audiometry testing chambers, and lights.

b. Fixed nonmedical equipment includes, but is not limited to, items such as walk-in refrigerators, kitchen

cooking equipment, serving lines, conveyors, mainframe computers, laundry, and similar equipment.

4.2.C. Movable Equipment (Medical and Nonmedical)

***4.2.C1.** Movable equipment includes items that require floor space or electrical and/or mechanical connections but are portable, such as wheeled items, portable items, office-type furnishings, and diagnostic or monitoring equipment. Movable equipment may require special structural design or access, electromechanical connections, shielding, or other considerations.

a. Movable medical equipment includes, but is not limited to, portable X-ray, electroencephalogram (EEG), electrocardiogram (EKG), treadmill and exercise equipment, pulmonary function equipment, operating tables, laboratory centrifuges, examination and treatment tables, and similar equipment.

b. Movable nonmedical equipment includes, but is not limited to, personal computer stations, patient room furnishings, food service trucks, case carts and distribution carts, and other portable equipment.

c. Facility planning and design shall consider the convenient and dedicated placement of equipment requiring floor space and mechanical connections and the voltage required for electrical connections where portable equipment is expected to be used. An equipment utility location drawing shall be produced to locate all services required by the equipment.

***4.3 Major Technical Equipment**

Major technical equipment is specialized equipment (medical or nonmedical) that is customarily installed by the manufacturer or vendor. Since major technical equipment may require special structural designs, electromechanical requirements, or other considerations, close coordination between owner, building designer, installer, construction contractors, and others is required.

4.4 Equipment Shown on Drawings

Equipment that is not included in the construction contract but requires mechanical or electrical service connections or construction modifications shall, insofar as practical, be identified on the design development documents to provide coordination with the architectural, mechanical, and electrical phases of construction.

4.5 Electronic Equipment

Special consideration shall be given to protecting computerized equipment such as multiphasic laboratory testing units, as well as computers, from power surges and spikes that might damage the equipment or programs. Consideration shall also be given to the addition of a constant power source where loss of data input might compromise patient care.

A4.1.B.
Design should consider the placement of cables from portable equipment so that circulation and safety are maintained.

A4.2.C1. Examples of movable equipment include operating tables, treatment and examination tables, laboratory centrifuges, food service trucks and other wheeled carts, and patient room furnishings.

A4.3 Major Technical Equipment

Examples of major technical equipment are X-ray and other imaging equipment, radiation therapy equipment, lithotripters, audiometry testing chambers, laundry equipment, computers, and similar items.

5. PLANNING, DESIGN, AND CONSTRUCTION

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

*5.1 Planning and Design

~~Planning for health care facilities shall include, in addition to space and operational needs, provisions for infection control and protection of patients during any renovations or new construction.~~

~~Continual health care facility upgrade through renovation and new construction involving existing facilities can create conditions that can be hazardous to patients.~~

~~During the programming phase of a construction project, the owner shall provide an Infection Control Risk Assessment (ICRA). An ICRA is a determination of the potential risk of transmission of various agents in the facility. This continuous process is an essential component of a facility functional or master program to provide a safe environment of care. The ICRA shall be conducted by a panel with expertise in infection control, risk management, facility design, construction, ventilation, safety, and epidemiology. The panel shall provide updated documentation of the risk assessment throughout planning, design, and construction. The ICRA shall only address building areas anticipated to be affected by construction.~~

~~The design professional shall incorporate the specific, construction-related requirements of the ICRA in the contract documents. The contract documents shall require the constructor to implement these specific requirements during construction.~~

~~The ICRA is initiated in design and planning and continues through construction and renovation. After considering the facility's patient population and programs, the ICRA shall address but not be limited to the following key elements:~~

~~(a)The impact of disrupting essential services to patients and employees~~

~~(b)Patient placement or relocation~~

~~(c) Placement of effective barriers to protect susceptible patients from airborne contaminants such as Aspergillus sp.~~

~~(d) Air handling and ventilation needs in surgical services, airborne infection isolation and protective environment rooms, laboratories, local exhaust systems for hazardous agents, and other special areas~~

~~(e) Determination of additional numbers of airborne infection isolation or protective environment room requirements~~

~~*(f) Consideration of the domestic water system to limit Legionella sp. and waterborne opportunistic pathogens~~

~~The assessment for internal and/or external construction projects also includes patient protection from demolition, ventilation and water management following planned or unplanned power outages, movement of debris, traffic flow, cleanup, and certification.~~
Facility construction, whether for freestanding buildings or expansion and/or renovation of existing

buildings, can create conditions that are harmful to patients and staff. For that reason, planning, design, and construction activities for health care facilities shall include, in addition to space and operational needs consideration of provisions for infection control, life safety, and protection of patients during construction.

5.1.A. Infection Control

During the programming phase of a project, the owner shall provide an Infection Control Risk Assessment (ICRA). An ICRA is a determination of the potential risk of transmission of various biological agents in the facility. Based on the ICRA, the owner shall also provide recommendations for design to be incorporated in the program and Infection Control Risk Mitigation Recommendations (ICRMR), which will describe the specific methods by which transmission will be avoided during the course of the construction project. The owner shall also provide monitoring of the effectiveness of the applied ICRMR during the course of the project.

The ICRA shall be conducted by a panel with expertise in infection control, risk management, facility design, construction and construction phasing, ventilation, safety, and epidemiology. The panel shall provide updated documentation of the risk assessment together with updated Mitigation Recommendations throughout planning, design, construction, and commissioning. The ICRA shall address, but not be limited to, the following:

5.1.A1. Design. Building design features shall be addressed when developing the ICRA.

a. Number, location, and type of airborne infection isolation and protective environment rooms.

b. Location(s) of special ventilation and filtration such as emergency department waiting and intake areas.

c. Air handling and ventilation needs in surgical services, airborne infection isolation and protective environment rooms, laboratories, local exhaust systems for hazardous agents, and other special areas.

d. Water systems to limit *Legionella* sp. and waterborne opportunistic pathogens.

*e. Finishes and surfaces.

5.1.A2. Construction. Building and site areas anticipated to be affected by construction shall be addressed when developing the ICRA.

a. The impact of disrupting essential services to patients and employees.

b. Determination of the specific hazards and protection levels for each.

c. Location of patients by susceptibility to infection and definition of risks to each.

d. Impact of potential outages or emergencies and protection of patients during planned or unplanned outages, movement of debris, traffic flow, cleanup, and testing and certification.

e. Assessment of external as well as internal construction activities.

f. Location of known hazards.

5.1.A3. Infection control risk mitigation recommendations. The ICRMR shall be prepared by the ICRA

panel and shall address, but not be limited to, the following:

a. Patient placement and relocation.

b. Standards for barriers and other protective measures required to protect adjacent areas and susceptible patients from airborne contaminants.

c. Temporary provisions or phasing for construction or modification of heating, ventilating, air conditioning, and water supply systems.

d. Protection from demolition

e. Measures to be taken to train hospital staff, visitors, and construction personnel.

The owner shall ensure that construction-related requirements of the ICRMR, as well as ICRA-generated design requirements, are incorporated into the project requirements.

The owner shall inspect the initial installation and provide continuous monitoring of the effectiveness of the infection control measures during the entire course of the project. This monitoring may be conducted by in-house infection control and safety staff or by independent outside consultants. In either instance, provisions for monitoring shall include written procedures for emergency suspension of work and protective measures indicating the responsibilities and limitations of each party (owner, designer, constructor, and monitor).

5.1.B. Reserved

***5.2 Phasing**

5.2.A.
Projects involving renovation of existing buildings shall include phasing to minimize disruption of existing patient services. This phasing is essential to ensure a safe environment in patient care areas.

5.2.B.
Phasing will include assurance for clean to dirty airflow, emergency procedures, criteria for interruption of protection, construction of roof surfaces, written notification of interruptions, and communication authority.

5.2.C.
Phasing plans shall include considerations of noise and vibration control that result from construction activities.

***5.2.D.**
Renovation areas shall be isolated from occupied areas during construction ~~using airtight barriers and exhaust airflow shall be sufficient to maintain negative air pressure in the construction zone.~~ based on the ICRA.

5.2.E.
Existing air quality requirements and other utility requirements for occupied areas shall be maintained.

***5.3 Commissioning**

Acceptance criteria for mechanical systems shall be specified. Crucial ventilation specifications for air balance and filtration shall be verified before owner acceptance. Areas requiring special ventilation include surgical services, protective environments, airborne infection isolation rooms, laboratories, and local exhaust systems for hazardous agents. These areas shall be recognized as requiring mechanical systems that ensure infection control, and ventilation deficiencies shall not be accepted. Acceptance criteria for local exhaust systems dealing with hazardous agents shall be specified and verified.

5.4 Nonconforming Conditions

It is not always financially feasible to renovate the entire existing structure in accordance with these Guidelines. In such cases, authorities having jurisdiction may grant approval to renovate portions of the structure if facility operation and patient safety in the renovated areas are not jeopardized by the existing features of sections retained without complete corrective measures.

A5.1.

Partitions and enclosures around renovation areas should be solid in nature, securely attached, and sealed at the floor and structure above. Where life safety does not warrant special constructions, measures should be taken to control the transmission of dust and other airborne substances. One method for achieving this is by means of a separate ventilation/exhaust system for the construction area, thereby maintaining negative air pressure in the construction area. This would require further documentation of the locations of fresh air intakes and filters (where necessary), as well as the disconnection of existing air ducts, as required.

A5.1 (f). In addition to the consideration of the domestic water system, consider eliminating or monitoring the use of decorative self-contained features such as decorative fountains or water features (water walls, etc.) as they may be a source of Legionella and/or waterborne opportunistic pathogens and are difficult to disinfect.

The current direction of providing medical care has created a need for the built medical environment to be flexible, to be able to meet changing requirements and not be disruptive to the provision of medical care. This can be accomplished in several ways:

- By having adequate space to allow interim program moves
- By constructing facilities with interstitial space
- By constructing facilities with adequate mechanical/electrical rooms, utility chases, and support corridors to allow expansion or change

Medical facilities require an infrastructure that is capable of keeping up with changes in medical technology and advancements in equipment and building systems.

Constructing facilities with interstitial space is often considered to be very expensive and not cost-effective. But when consideration is given to the life of the facility, the use of interstitial space reduces maintenance cost, allows mechanical and electrical activities that normally would shut down program activities, and allows easy additions to the infrastructure systems. Interstitial construction can also shorten the construction schedule by allowing finish work to be accomplished at the same time infrastructure work is being done. A systematic design approach to the use of interstitial space is essential.

A5.1.A1.e. Preferred surface characteristics: (the ideal product)

1. Ease of maintenance/cleanable and repair
2. Does not support microbial growth
3. Non-porous – smooth
4. Sound absorption/acoustics
5. Inflammable – Class I fire rating or better
6. Durable
7. Sustainable
8. Low VOC/no off-gassing
9. Low smoke toxicity
10. Initial and life-cycle cost-effectiveness
11. Slip resistance – appropriate coefficient of friction
12. Ease of installation, demolition, and replacement
13. Non-problematic substrate and/or assemblies

14. Seamless
15. Resilient, impact resistant
16. Control of reflectivity/glare
17. Options for color, pattern, and texture
18. Non-toxic/non-allergenic

A5.2.D.
Maintain negative air pressure in the construction zone by means of a separate ventilation/exhaust system for the construction area. Review locations of exhaust relative to existing fresh air intakes and filters, as well as the disconnection and sealing of existing air ducts, as required. If the building system or a portion thereof is used to achieve this requirement, the system must be thoroughly cleaned prior to occupancy of the construction area.

~~Particular attention should be paid to areas requiring special ventilation, including surgical services, protective environment rooms, airborne infection isolation rooms, laboratories, autopsy rooms, and local exhaust systems for hazardous agents. It should be recognized that these areas need mechanical systems that comply with infection control and/or laboratory safety requirements.~~

A5.3 Commissioning

Commissioning is a quality process used to achieve, validate, and document that facilities and component infrastructure systems are planned, constructed, installed, tested, and are capable of being operated and maintained in conformity with the design intent or performance expectations. This process extends through all phases of a new or renovation project from conceptual design to occupancy and operations. Checks at each stage of the process should be made to ensure validation of performance to meet the owner's design requirements. Commissioning should be performed by an entity that is independent from the installing contractor.

Historically, the term "commissioning" has referred to the process by which the heating, ventilation, and air conditioning (HVAC) system of a building was tested and balanced according to established standards prior to acceptance by the building owner. The HVAC commissioning did not include other building components that did not directly affect the performance of the HVAC systems. Today, the definition of commissioning is being expanded to total building commissioning (TBC). The fundamental objective of TBC is to create a process whereby the owner will be assured that all building and system components, not just the HVAC system, will function according to design intent, specifications, equipment manufacturers' data sheets, and operational criteria. Because all building systems are integrated and validated, the owner can expect benefits to include improved occupant comfort, energy savings, environmental conditions, system and equipment function, building operation and maintenance, and building occupants' productivity.

The TBC process should include a feedback mechanism that can be incorporated into the owner's post-evaluation process to enhance future facility designs.

Facility acceptance criteria should be based on the commissioning requirements specified in the contract documents. These criteria specify the tests, training, and reporting requirements necessary for the owner to validate that each building system complies with the performance standards of the basis of design and for final acceptance of the facility.

Key systems and components that need to be tested and validated, as a minimum, during the TBC process

include the design and operations of the HVAC, plumbing, electrical, emergency power, fire protection/suppression, telecommunications, nurse call, intrusion and other alarm devices, and medical gas systems, as well as specialty equipment. Air balancing, pressure relationships, and exhaust criteria for mechanical systems must be clearly described and tested to create an environment of care that provides for infection control. Areas requiring emergency power must be specified and tested. Special plumbing systems must be certified to support the chemicals scheduled for use in them. While all areas of the health care facility are included in the commissioning process, the following areas are of particular concern: critical and intensive care areas; surgical services; isolation rooms, including those used for airborne infection/pathogens; pharmacies, and other areas potentially containing hazardous substances.

A reference source for an existing HVAC commissioning process is ASHRAE Guideline 1-1996.

6. RECORD DRAWINGS AND MANUALS

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

6.1 Drawings

Upon occupancy of the building or portion thereof, the owner shall be provided with a complete set of legible drawings showing construction, fixed equipment, and mechanical and electrical systems, as installed or built. Drawings shall include a life safety plan for each floor reflecting NFPA 101 requirements.

6.2 Equipment Manuals

Upon completion of the contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions; parts lists; and procurement information with numbers and a description for each piece of equipment. Operating staff shall also be provided with instructions on how to properly operate systems and equipment. Required information shall include energy ratings as needed for future conservation calculations.

6.3 Design Data

The owners shall be provided with complete design data for the facility. This shall include structural design loadings; summary of heat loss assumption and calculations; estimated water consumption; medical gas outlet listing; list of applicable codes; and electric power requirements of installed equipment. All such data shall be supplied to facilitate future alterations, additions, and changes, including, but not limited to, energy audits and retrofit for energy conservation.

7. GENERAL HOSPITAL

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

7.1 General Considerations

7.1.A. ~~Functions~~ Functional Program
There shall be for each project a functional program for the facility in accordance with Section 1.1.F.

7.1.B. Standards
The general hospital shall meet all the standards described herein. Deviations shall be described and justified in the functional program for specific approval by the authorities having jurisdiction.

7.1.C. Sizes
Department size and clear floor areas will depend on program requirements and organization of services within the hospital. Some functions may be combined or shared providing the layout does not compromise safety standards and medical and nursing practices.

***7.1.D. Parking**
Each new facility, major addition, or major change in function shall have parking space to satisfy the needs of patients, personnel, and public. A formal parking study is desirable. In the absence of such a study, provide one space for each bed plus one space for each employee normally present on any single weekday shift. This ratio may be reduced in an area convenient to public transportation or public parking facilities, or where carpool or other arrangements to reduce traffic have been developed. Additional parking may be required to accommodate outpatient and other services. Separate and additional space shall be provided for service delivery vehicles and vehicles utilized for emergency patients.

***7.1.E. Swing Beds**
When the concept of swing beds is part of the functional program, care shall be taken to include requirements for all intended categories.

7.2 Nursing Unit (Medical and Surgical)

See other sections of this document for special-care area units such as recovery rooms, critical care units, pediatric units, rehabilitation units, and skilled nursing care or other specialty units.

Each nursing unit shall include the following (see Section 1.3 for waiver of standards where existing conditions make absolute compliance impractical):

7.2.A. Patient Rooms
Each patient room shall meet the following standards:

~~*~~**7.2.A1.** Unless the functional program demonstrates the value of a multiple-bed arrangement, the maximum number of beds per room shall be one. ~~Maximum room capacity shall be two patients.~~ Where renovation work is undertaken and the present capacity is more than ~~two~~ one patient~~s~~, maximum room capacity shall be no more than the present capacity, with a maximum of four patients.

***7.2.A2.** In new construction, patient rooms shall be constructed to meet the needs of the functional program and have a minimum of 100 square feet (9.29 square meters) of clear floor area per bed in multiple-bed rooms and 120 square feet (10.8 square meters) of clear floor area ~~for~~ in single-bed rooms,

exclusive of toilet rooms, closets, lockers, wardrobes, alcoves, or vestibules. The dimensions and arrangement of rooms shall be such that there is a minimum of 3 feet (0.91 meter) between the sides and foot of the bed and any wall or any other fixed obstruction. In multiple-bed rooms, a clearance of 4 feet (1.22 meters) shall be available at the foot of each bed to permit the passage of equipment and beds. Minor encroachments, including columns and ~~lavatories~~handwashing stations, that do not interfere with functions may be ignored when determining space requirements for patient rooms. Where renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above minimum standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, patient rooms shall have no less than 80 square feet (7.43 square meters) of clear floor area per bed in multiple-bed areas and 100 square feet (9.29 square meters) of clear floor area in single-bed rooms, exclusive of the spaces noted previously in this section.

***7.2.A3.** Each patient room shall have a window in accordance with Section 7.~~28~~31.A10.

***7.2.A4.** For patient/family-centered rooms, see Appendix A.

***7.2.A~~4~~5.** Handwashing stations shall be provided to serve each patient room. A handwashing station shall be located in the toilet room. ~~In new construction a~~A handwashing station shall be provided in the patient room in addition to that in the toilet room and shall be located outside of the patient's cubicle curtain ~~so that it is accessible~~ and convenient to staff entering the room.

7.2.A~~5~~6. Each patient shall have access to a toilet room without having to enter the general corridor area. One toilet room shall serve no more than four beds and no more than two patient rooms. The toilet room shall contain a water closet and a handwashing station, and the door shall swing outward or be double acting. Where local requirements permit, ~~sliding or~~ folding doors may be used, provided adequate provisions are made for acoustical privacy and patient privacy.

7.2.A~~6~~7. Each patient shall have within his or her room a separate wardrobe, locker, or closet suitable for hanging full-length garments and for storing personal effects.

7.2.A~~7~~8. In multiple-bed rooms, visual privacy from casual observation by other patients and visitors shall be provided for each patient. The design for privacy shall not restrict patient access to the entrance, ~~lavatory~~handwashing station, or toilet.

7.2.B. Service Areas

Provision for the services listed below shall be in or readily available to each nursing unit. The size and location of each service area will depend upon the numbers and types of beds served. Identifiable spaces are required for each of the indicated functions. Each service area may be arranged and located to serve more than one nursing unit but, unless noted otherwise, at least one such service area shall be provided on each nursing floor. Where the words *room* or *office* are used, a separate, enclosed space for the one named function is intended; otherwise, the described area may be a specific space in another room or common area.

***7.2.B1.** Administrative center(s) or nurse station(s). This area shall have space for counters and storage and shall have convenient access to handwashing stations. It ~~may~~ shall be permitted to be combined with or include centers for reception and communication. ~~Preferably, the station should permit visual observation of all traffic into the unit.~~

7.2.B2. Dictation area. This area ~~should~~ shall be adjacent to but separate from the nurse station.

7.2.B3. Nurse or supervisor office.

7.2.B4. Handwashing stations~~.,~~. These shall be conveniently accessible to the nurse station, medication station, and nourishment center. One handwashing station may serve several areas if convenient to each.

7.2.B5. Charting facilities. Charting facilities shall have linear surface space to ensure that staff and physicians may chart and have simultaneous access to information and communication systems.

7.2.B6. Toilet room(s). These shall be conveniently located for staff use (may be unisex).

7.2.B7. Staff lounge facilities. Lounge facilities shall be provided and shall be programmatically sized, but shall not be less than 100 square feet (9.3 square meters).

7.2.B8. Staff storage area. Securable closets or cabinet compartments for the personal articles of nursing personnel, located in or near the nurse station. At a minimum, these shall be large enough for purses and billfolds. Coats may be stored in closets or cabinets on each floor or in a central staff locker area.

***7.2.B9.** Multipurpose room(s). Rooms shall be provided for staff, patients, patients' families for patient conferences, reports, education, training sessions, and consultation. These rooms ~~must~~ shall be accessible to each nursing unit. They may be on other floors if convenient for regular use. One such room ~~may~~ shall be permitted to serve several nursing units and/or departments.

7.2.B10. Examination/treatment room(s). Such rooms may be omitted if all patient rooms in the nursing unit are single-bed rooms. Centrally located examination and treatment room(s) may serve more than one nursing unit on the same floor. Such rooms shall have a minimum floor area of 120 square feet (10.8 square meters). The room shall contain a handwashing station; storage facilities; and a desk, counter, or shelf space for writing. Provision shall be made to preserve patient privacy from observation from outside the exam room through an open door.

7.2.B11. Clean workroom or clean supply room. If the room is used for preparing patient care items, it shall contain a work counter, a handwashing station, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and handwashing station may be omitted. Soiled and clean workrooms or holding rooms shall be separated and have no direct connection.

7.2.B12. Soiled workroom or soiled holding room. This room shall be separate from the clean workroom. ~~The soiled workroom~~It shall contain a clinical sink (or equivalent flushing-rim fixture)~~. The room shall contain~~ and a ~~lavatory (or~~ handwashing station~~)~~. The above fixtures shall both have a hot and cold mixing faucet. The room shall have a work counter and space for separate covered containers for soiled linen and waste. ~~Rooms used only for temporary holding of soiled material may omit t~~The clinical sink and work counter may be omitted from rooms used only for temporary holding of soiled material. If the flushing-rim clinical sink is eliminated, facilities for cleaning bedpans shall be provided elsewhere.

7.2.B13. Medication station. Provision shall be made for distribution of medications. This may be done from a medicine preparation room or unit, from a self-contained medicine dispensing unit, or by another approved system.

a. Medicine preparation room. This room shall be under visual control of the nursing staff. It shall contain a work counter, a ~~sink adequate for~~ handwashing station, refrigerator, and locked storage for controlled drugs. When a medicine preparation room is to be used to store one or more self-contained medicine-dispensing units, the room shall be designed with adequate space to prepare medicines with the self-contained medicine~~-~~-dispensing unit(s) present.

b. Self-contained medicine-dispensing unit. A self-contained medicine-dispensing unit may be located at the nurse station, in the clean workroom, or in an alcove, provided the unit has adequate security for controlled drugs and adequate lighting to easily identify drugs. Convenient access to handwashing stations shall be provided. (Standard cup-sinks provided in many self-contained units are not adequate for handwashing.)

7.2.B14. Clean linen storage. Each nursing unit shall contain a designated area for clean linen storage. This may be within the clean workroom, a separate closet, or an approved distribution system on each floor. If a closed cart system is used, storage may be in an alcove. It must be out of the path of normal traffic and under staff control.

7.2.B15. Nourishment area. There shall be a nourishment area with sink, work counter, refrigerator, storage cabinets, and equipment for hot and cold nourishment between scheduled meals. The nourishment area shall include space for trays and dishes used for nonscheduled meal service. Provisions and space shall be included for separate temporary storage of unused and soiled dietary trays not picked up at mealtime. Handwashing stations shall be in or immediately accessible from the nourishment area.

7.2.B16. Ice machine. Each nursing unit shall have equipment to provide ice for treatments and nourishment. Ice-making equipment may be in the clean work~~-~~room/holding room or at the nourishment station. Ice intended for human consumption shall be from self-dispensing ice makers. Copper tubing shall be provided for supply connections to ice machines.

7.2.B17. Equipment storage room or alcove. Appropriate room(s) or alcove(s) shall be provided for storage of equipment necessary for patient care and as required by the functional program. Each unit shall provide sufficient storage area(s) located on the patient floor to keep its required corridor width free of all equipment and supplies, but not less than 10 square feet (0.93 square meters) per patient bed shall be provided.

***7.2.B18.** Storage space for stretchers and wheelchairs. Space shall be provided in a strategic location, without restricting normal traffic.

7.2.B19. Showers and bathtubs. ~~When~~ Where individual bathing facilities are not provided in patient rooms, there shall be at least one shower and/or bathtub for each 12 beds without such facilities. Each bathtub or shower shall be in an individual room or enclosure that provides privacy for bathing, drying, and dressing. A toilet shall be provided within or directly accessible to each central bathing facility. Special bathing facilities, including space for attendant, shall be provided for patients on stretchers, carts, and wheelchairs at the ratio of one per 100 beds or a fraction thereof. ~~This~~ These facilities may be on a separate floor if convenient for use.

7.2.B20. Patient toilet room(s).~~, in addition to those serving bed areas, shall be conveniently located to multipurpose room(s) and within or directly accessible to each central bathing facility. Patient toilet rooms serving multipurpose rooms may shall be permitted toalso be designated for public use.~~ A toilet room(s) with handwashing station shall be located convenient to multipurpose room(s). If the functional program calls for the toilet rooms(s) to be for patient use, it shall be designed/equipped for patient use. If called out in the functional program, the toilet room(s) serving the multipurpose rooms(s) may also be designated for patient use.

7.2.B21. Emergency equipment storage. Space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a cardiopulmonary resuscitation (CPR) cart. This space shall be located in an area appropriate to the functional program, but out of normal traffic.

7.2.B22. Housekeeping room. One housekeeping room shall be provided for each nursing unit or nursing floor. It shall be directly accessible from the unit or floor and may serve more than one nursing unit on a floor. At least one housekeeping room per floor shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

Note: This housekeeping room may not be used for other departments and nursing units that require separate housekeeping rooms.

7.2.B23. Visitor lounge. Each nursing unit shall have direct access to a lounge, for visitors and family, that is programmatically sized appropriate for the number of beds and/or nursing units served. This lounge shall be conveniently located to the nursing unit(s) served, provide comfortable seating, and be designed to minimize the impact of noise and activity on patient rooms and staff functions.

***7.2.C. Airborne Infection Isolation Room(s)**

Note: The airborne infection isolation room requirements contained in these Guidelines for particular service areas throughout a facility should be predicated on an Infection Control Risk Assessment (ICRA) and based on the needs of specific community and patient populations served by an individual ~~organization~~health care provider. The number of airborne infection isolation rooms for individual patient units shall be increased based upon an ICRA or by a multidisciplinary group designated for that purpose. This process ensures a more accurate determination of environmentally safe and appropriate room types and spatial needs. Special ventilation requirements are found in Table 7.2. It is suggested that reference be made to the Centers for Disease Control and Prevention (CDC) "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health Care Facilities" as they appear in the *Federal Register* dated October 28, 1994, ~~and~~ CDC's *Guidelines for Environmental Infection Control in Health-Care Facilities*, December 2003 ~~*Morbidity and Mortality Weekly Report (MMWR)* 1994:43 (No. RR-13), and the "Guidelines for Prevention of Nosocomial Pneumonia, 1994," published by CDC in the *American Journal of Infection Control* (22:247-292)~~.

7.2.C1. At least one airborne infection isolation room shall be provided in the hospital. These rooms may be located within individual nursing units and used for normal acute care when not required for isolation cases, or they may be grouped as a separate isolation unit. Each room shall contain only one bed and shall comply with the acute-care patient room section of this document as well as the following:

7.2.C2. Each airborne infection isolation room shall have an area for handwashing, gowning, and storage of clean and soiled materials located directly outside or immediately inside the entry door to the room.

7.2.C3. Airborne infection isolation room perimeter walls, ceiling, and floors, including penetrations, shall be sealed tightly so that air does not infiltrate the environment from the outside or from other spaces. (See Glossary.)

7.2.C4. Airborne infection isolation room(s) shall have self-closing devices on all room exit doors.

7.2.C5. Separate toilet, bathtub (or shower), and handwashing stations shall be required for each airborne infection isolation room.

7.2.C6. Airborne infection isolation rooms may be used for noninfectious patients when not needed for patients with airborne infectious disease.

7.2.C7. Rooms shall have a permanently installed visual mechanism to constantly monitor the pressure

status of the room when occupied by patients with an airborne infectious disease. The mechanism shall continuously monitor the direction of the airflow.

7.2.C8. Rooms with reversible airflow provisions for the purposes of switching between protective environment and airborne infection isolation rooms shall not be permitted.

***7.2.D. Protective Environment Room(s)**

Note: The differentiating factor between protective environment rooms and other patient rooms is the requirement for positive air pressure relative to adjoining spaces, with all supply air passing through high-efficiency particulate air (HEPA) filters with 99.97 percent efficiency for particles > 0.3 µm in diameter. When determined by an Infection Control Risk Assessment (ICRA), special design considerations and air ventilation to ensure the protection of patients with these conditions shall be required. The appropriate numbers and location of protective environment rooms shall be concluded by the ICRA. Protective environment room(s) shall contain only one bed and shall comply with Section 7.2.C. Special ventilation requirements are found in Table 7.2. Also see special guidelines for protective environment rooms during renovation and construction in Section 5.1.

7.2.D1. As designated by the functional program, both airborne infection isolation and protective environment rooms may be required. One single room, with an air-handling system switchable from negative to positive, shall not be provided to serve both functions. Many facilities care for patients with an extreme susceptibility to infection, (e.g., immunosuppressed patients with prolonged granulocytopenia, most notably bone marrow recipients; or solid-organ transplant recipients and patients with hematological malignancies who are receiving chemotherapy and are severely granulocytopenic). These rooms are not intended for use with patients diagnosed with HIV infection or AIDS, unless they are also severely granulocytopenic. Generally, protective environments are not needed in community hospitals, unless these facilities take care of these types of patients. The appropriate clinical staff should be consulted regarding room type, and spatial needs to meet facility infection control requirements should be incorporated into design programming.

7.2.D2. Each protective environment room shall have an area for handwashing, gowning, and storage of clean and soiled materials located directly outside or immediately inside the entry door to the room.

7.2.D3. Protective environment room perimeter walls, ceiling, and floors, including penetrations, shall be sealed tightly so that air does not infiltrate the environment from the outside or from other spaces.

7.2.D4. Protective environment room(s) shall have self-closing devices on all room exit doors.

7.2.D5. Separate toilet, bathtub (or shower), and handwashing stations shall be provideddirectly accessible from for each protective environment room.

7.2.D6. Rooms shall have a permanently installed visual mechanism to constantly monitor the pressure status of the room when occupied by patients requiring a protective environment. The mechanism shall continuously monitor the direction of the airflow.

***7.2.D7.** Rooms in Aallogeneic bone marrow transplant units shouldshall be designed to meet specific patient needs.

7.2.D8. Rooms with reversible airflow provisions for the purpose of switching between protective environment and airborne infection isolation functions are not acceptable.

7.2.E. Seclusion Room(s)

If indicated by the functional program, ~~T~~the hospital shall provide one or more single bedrooms for patients needing close supervision for medical and/or psychiatric care. ~~This~~ These rooms may be part of the psychiatric unit described in Section 7.~~6~~7. If the single bedroom(s) is part of the acute-care nursing unit, the provisions of Section 7.~~6~~7.A shall apply, with the following exceptions: each room shall be for single occupancy; each shall be located to permit staff observation of the entrance, preferably adjacent to the nurse station; and each shall be designed to minimize the potential for escape, hiding, injury, or suicide. If vision panels are used for observation of patients, the arrangement shall ~~i~~ensure patient privacy and prevent casual observation by visitors and other patients.

***7.2.F. Protected Units**

7.3 Intermediate Care Units

Intermediate care units, sometimes referred to as stepdown units, are routinely utilized in acute care hospitals for patients who require frequent monitoring of vital signs and/or nursing intervention that exceeds the level needed in a regular medical/surgical unit but is less than that provided in a critical care unit.

Intermediate care units can be progressive care units or specialty units such as cardiac, surgical (i.e., thoracic, vascular, etc.), neurosurgical/neurological monitoring, or chronic ventilator respiratory care units.

These standards shall apply to adult beds designated to provide intermediate care, but not pediatric or neonatal intermediate care.

In hospitals that provide intermediate care, beds shall be designated for this purpose. These beds may constitute a separate unit or be a designated part of another unit.

There shall be a separate physical area devoted to nursing management for the care of the intermediate patient.

7.3.A Patient Rooms
The following shall apply to all intermediate care units unless otherwise noted.

7.3.A1. Maximum room capacity shall be four patients.

7.3.A2. In new construction, patient rooms shall be constructed to meet the needs of the functional program and have a minimum of 120 square feet (10.8 square meters) of clear floor area per bed in multiple-bed rooms and 150 square feet (13.94 square meters) of clear floor area for single-bed rooms, exclusive of toilet rooms, closets, lockers, wardrobes, alcoves, or vestibules. The dimensions and arrangement of rooms shall be such that there is a minimum clearance of 4 feet (1.22 meters) between the sides of the beds and other beds, walls, or fixed obstructions. A minimum clearance of 6 feet (1.83 meters) shall be available at the foot of each bed to permit the passage of equipment and beds. Where renovation work is undertaken, every effort shall be made to meet these standards. If it is not possible to meet these minimum standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, patient rooms shall have no less than 100 square feet (9.29 square meters) of clear floor area per bed in multiple-bed rooms and 120 square feet (10.8 square meters) of clear floor area in single-bed rooms.

7.3.A3. Each patient room shall have a window in accordance with Section 7.31.A10.

7.3.A4. Access to at least one airborne infection isolation room shall be provided unless provided eleswhere in the facility. The number of airborne infection isolation rooms shall be determined on the basis of an Infection Control Risk Assessment. Each room shall contain only one bed and shall comply with the requirements of Section 7.2.C. Special ventilation requirements are found in Table 7.2.

7.3.A5. Handwashing stations shall be provided to serve each patient room. At least one handwashing station shall be provided for every four patients.

In new construction and renovation, a handwashing station shall be provided in the patient room in addition to that in the toilet room and located outside the patient's cubicle curtain so that it is convenient to staff entering the room.

7.3.A6. Each patient shall have access to a toilet room without having to enter the general corridor. One toilet room shall serve no more than four beds and no more than two patient rooms. The toilet room shall contain a water closet and a handwashing station, and the room door shall swing outward or be double acting. Where local requirements permit, folding doors may be used, provided adequate provisions are made for acoustical privacy and patient privacy.

7.3.A7. Patients shall have access to bathing facilities within their rooms or in a central bathing facility. Each shower or bathtub in a central bathing facility shall be in an individual room or enclosure that provides privacy for bathing, drying, and dressing. A water closet and lavatory in a separate enclosure shall be directly accessible to each central bathing facility.

7.3.A8. Each patient shall have within his or her room a separate wardrobe, locker, or closet suitable for hanging full-length garments and for storing personal effects.

7.3.A9. In multiple-bed rooms, visual privacy shall be provided for each patient. The design for privacy shall not restrict patient access to the room entrance, lavatory, toilet, or room windows.

7.3.A10. Nurse calling systems for two-way voice communication shall be provided in accordance with Section 7.35.G. The call system for the unit shall include provisions for an emergency code resuscitation alarm to summon assistance from outside the intermediate care unit.

7.3.B. Service Areas

Provision for the services listed below shall be in or readily available to each intermediate care unit. The size and location of each service area will depend upon the numbers and types of beds served. Identifiable spaces are required for each of the indicated functions. Services may be shared with adjacent units. Where the words "room" or "office" are used, a separate, enclosed space for the one named function is intended; otherwise, the described area may be a specific space in another room or common area.

7.3.B1. Administrative center or nurse station. This area shall have space for counters and storage and shall have convenient access to handwashing stations. The station shall provide direct visual observation of each patient and all traffic into and out of the unit.

7.3.B2. Dictation area. This shall be adjacent to but separate from the nurse station.

7.3.B3. Charting facilities. Charting facilities shall have linear surface space to ensure that staff and physicians may chart and have simultaneous access to information and communication systems.

7.3.B4. Handwashing facilities. Handwashing facilities shall be conveniently accessible to the nurse station, medication station, and nourishment station. One handwashing station may serve several areas if convenient to each.

7.3.B5. Staff lounge facilities. Staff lounge facilities shall be provided and shall be programmatically sized, but shall not be less than 100 square feet (9.3 square meters). These facilities shall be located convenient to the intermediate care unit.

7.3.B6. Toilet room(s). They shall be conveniently located for staff use (may be unisex).

7.3.B7. Storage facilities. Securable closets or cabinet compartments for the personal articles of nursing personnel shall be located in or near the nurse station. At a minimum, they shall be large enough for purses and billfolds. Coats may be stored in closets or cabinets on each floor or in a central staff locker area.

7.3.B8. Examination/treatment room(s). An examination/treatment room shall be located immediately adjacent to the intermediate care unit. Each room shall have a minimum floor area of 120 square feet (11.15 square meters). The room shall contain a handwashing station; storage facilities; and a desk, counter, or shelf space for writing. This service may be shared with the other units on the floor. Provision shall be made to preserve patient privacy from observation from outside the exam room through an open door.

7.3.B9. A clean workroom. This room shall be separate from the soiled workroom. The clean workroom shall contain a work counter, a handwashing station, and storage space for clean and sterile supplies. This room shall have a minimum clear floor area of 100 square feet (9.29 square meters).

7.3.B10. A soiled workroom. This room shall be separate from the clean workroom. The soiled workroom shall contain a clinical sink (or equivalent flushing-rim fixture), a work counter, a handwashing station, and separate space for covered containers for soiled linen and waste. This room shall have a minimum clear floor area of 100 square feet (9.29 square meters).

7.3.B11. Medication station. Provision shall be made for 24-hour distribution of medications. This may be done from a medicine preparation room or unit, from a self-contained medicine dispensing unit, or by another approved system.

a. Medicine preparation room. This room shall be under visual control of the nursing staff. It shall contain a work counter, a sink adequate for handwashing, a lockable refrigerator, and locked storage for controlled drugs. This room shall have a minimum of clear floor area of 50 square feet (4.65 square meters).

b. Self-contained medicine dispensing unit. A self-contained medicine dispensing unit may be located at the nurse station, in the clean workroom, or in an alcove, provided the unit has adequate security for controlled drugs and adequate lighting to easily identify drugs. Convenient access to handwashing stations shall be provided.

7.3.B12. Nourishment area. There shall be a nourishment area with a work counter, a handwashing station, a refrigerator, storage cabinets, and equipment for preparing and serving hot and cold nourishments between scheduled meals. This room shall have a minimum clear floor area of 50 square feet (4.65 square meters).

7.3.B13. Ice machine. A self-dispensing ice machine shall be provided to supply ice for treatments and

nourishment.

7.3.B14. Equipment storage room. An equipment storage room shall be provided for storage of equipment necessary for patient care. This room may serve more than one unit.

7.3.B15. Emergency equipment storage. Space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a cardiopulmonary resuscitation (CPR) cart. This space shall be located in an area appropriate to the functional program, but out of normal traffic.

7.3.B16. A housekeeping room. This service may be shared with the other units on the floor.

7.3.C Mechanical standards. Ventilation, oxygen, vacuum, medical air, electrical and plumbing requirements shall be as per sections 7.35.E2 and 7.35.G4 and Tables 7.2 and 7.5.

7.~~3~~4 Critical Care Units

Critical care units require special space and equipment considerations for safe and effective patient care, staff functions, and family participation. Families and visitors to critical care units often wait for long periods~~ of time~~, including overnight~~ stays~~, under highly stressful situations. They tend to congregate at unit entries to be readily accessible to staff interaction. Clinical personnel perform in continously stressful circumstances over long hours. Often they cannot leave the critical care unit necessitating space and services to accommodate their personal and staff group needs in close proximity to the unit. Design shall address such issues as privacy, atmosphere, and aesthetics for all involved in the care and comfort of patients in critical care units. ~~In addition, space arrangement shall include provisions for immediate access of emergency equipment from other departments.~~

Not every hospital will provide all types of critical care. Some hospitals may have a small combined unit; others may have separate, sophisticated units for highly specialized treatments. Critical care units shall comply in size, number, and type with these standards and with the functional program. The following standards are intended for ~~the more common types of~~ typical critical care services. Design shall comply with these standards and shall be appropriate to needs ~~defined~~ of the ~~in~~ functional program~~s~~. Where specialized services are required, additions and/or modifications shall be made as necessary for efficient, safe, and effective patient care.

7.~~3~~4.A. Critical Care (General)
The following shall apply to all types of critical care units unless otherwise noted. ~~Each unit shall comply with the following provisions:~~

7.~~3~~4.A1. Unit location. The location shall offer convenient access from the emergency, respiratory therapy, laboratory, radiology, surgery, and other essential departments and services as defined by the functional program. It shall be located so that the medical emergency resuscitation teams ~~may be able to~~can respond promptly to emergency calls with~~in~~ minimum travel time. In addition, space arrangement shall include provisions for immediate access to emergency equipment from other departments. The location shall be arranged to eliminate the need for through traffic.

***7.~~3~~4.A2.** Elevator transport. In new construction, where elevator transport is required for critically ill patients, the size of the cab, door width, and mechanisms and controls shall meet the specialized needs.

***7.~~3~~4.A3.** Room size. In new construction, each patient space (whether separate rooms, cubicles, or multiple-~~-~~bed space) shall have a minimum of 200 square feet (18.58 square meters) of clear floor area

with a minimum headwall width of 13 feet (3.96 meters) per bed, exclusive of anterooms, vestibules, toilet rooms, closets, lockers, wardrobes, and/or alcoves. Bed clearances for all adult and pediatric units shall be a minimum of 4 feet (1.21 meters) at the foot of the bed to the wall, 5 feet (1.52 meters) on the transfer side, 4 feet (1.21 meters) on the non-transfer side, and 8 feet (2.43 meters) between beds.

In renovation of existing ~~intensive~~ critical care units, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above square-foot standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, separate rooms or cubicles for single patient use shall be no less than 150 square feet (13.94 square meters), and multiple-bed space shall contain at least ~~130~~ 150 square feet (~~12.08~~13.94 square meters) of clear floor area per bed, exclusive of the spaces noted in the previous paragraph.

7.~~3~~4.A4. Privacy.
a. When private rooms or cubicles are provided, view panels to the corridor shall be required with a means to ~~provide~~ ensure visual privacy.

b.- Each patient bed area shall have space at each bedside for visitors, and shall have provisions for visual privacy from casual observation by other patients and visitors.

7.4.A5. Doors
a. Where only one door is provided to a bed space, it shall be at least 4 feet (1.22 meters) wide and arranged to minimize interference with movement of beds and large equipment. Sliding doors shall not have floor tracks and shall have hardware or a breakaway feature that minimizes jamming possibilities.

b. Where sliding doors are used for access to cubicles within a suite, a 3-foot-wide (0.91 meter) swinging door ~~may~~shall be permitted ~~also be provided~~ for personnel communication.

~~**7.34.A5.** Each patient bed area shall have space at each bedside for visitors, and shall have provisions for visual privacy from casual observation by other patients and visitors. For both adult and pediatric units, there shall be a minimum of 8 feet (2.44 meters) between beds.~~

7.~~3~~4.A6. Windows
a. Each patient bed shall have visual access, other than skylights, to the outside environment, with not less than one outside window in each patient bed area, in accordance with Section 7.31.A10.

b. In renovation projects, clerestory windows with windowsills above the heights of adjacent ceilings may be used, provided they afford patients a view of the ~~exterior~~ outside and are equipped with appropriate forms of glare and sun control. Distance from the patient bed to the outside window shall not exceed 50 feet (15.24 meters). ~~When~~ Where partitioned cubicles are used, patients' view to outside windows ~~may~~ shall be through no more than two separate clear vision panels.

7.~~3~~4.A7. Nurse call system. ~~Systems for rapid and easy information exchange with a hospital are important.~~ Nurse call~~ing~~ systems for two-way voice communication shall be provided in accordance with Section 7.3~~2~~5.G. The ~~call~~ communication system for the unit shall include provisions for an emergency code resuscitation alarm to summon assistance from outside the critical care unit.

7.~~4~~3.A8. Handwashing stations. Handwashing stations shall be convenient to nurse stations and patient bed areas. There shall be at least one handwashing station for every three beds in open plan areas, and one in each patient room. The handwashing station ~~should~~ shall be located near the entrance to the patient cubicle or room, ~~should be~~ sized to minimize splashing water onto the floor, and ~~should be~~ equipped with hands-free operable controls. Where towel dispensers are provided, they shall operate so that dispensing

requires only the towel to be touched.

***7.34.A9.** Administrative center or nurse station. This area shall have space for counters and storage. It may shall be permitted to be combined with or include centers for reception and communication. There shall be direct or remote visual observation between the administration administrative center, or nurse station, or staffed charting stations and all patient beds in the critical care unit.

7.34.A10. Monitoring equipment. Each unit shall contain equipment for continuous monitoring, with visual displays for each patient at the bedside and at the nurse station. Monitors shall be located to permit easy viewing and access but not interfere with access to the patient.

7.34.A11. Emergency equipment storage. Space that is easily accessible to the staff shall be provided for emergency equipment such as a cardiopulmonary resuscitation (CPR) cart.

***7.34.A12.** Medication station. Provision shall be made for storage and distribution of emergency drugs and routine medications. This may be done from a medicine preparation room or unit, from a self-contained medicine--dispensing unit, or by another system. If used, a medicine preparation room or unit shall be under visual control of nursing staff. It shall contain a work counter, cabinets for storage of supplies, sink with hot and cold water supply, refrigerator for pharmaceuticals, and doubled--locked storage for controlled substances. Convenient access to handwashing stations shall be provided. (Standard cup-sinks provided in many self-contained units are not adequate for handwashing.)

7.34.A13. The electrical, medical gas, heating, ventilation, and communication services air conditioning shall support the needs of the patients and critical care team members under normal and emergency situations.

7.34.A14. Airborne infection isolation room. At least one airborne infection isolation room shall be provided, unless provided in another critical care unit. The number of airborne infection isolation rooms shall be determined based on an Infection Control Risk AssessmentICRA. Each room shall contain only one bed and shall comply with the requirements of Section 7.2.C; however, the requirement for the bathtub (or shower) may be eliminated. Compact, modular toilet/sink combination units may replace the requirement for a "toilet room." Special ventilation requirements are found in Table 7.2.

***7.34.A15.** Service spaces. The following additional service spaces shall be immediately available within each critical care suite. These They may be shared by more than one critical care unit provided that direct access is available from each.

a. Securable storage areas for staff. cClosets or cabinet compartments shall be provided for the personal effects of nursing personnel, located in or near the nurse station. At a minimum, these shall be large enough for purses and billfolds. Coats may shall be permitted to be stored in closets or cabinets on each floor or in a central staff locker area.

b. Clean workroom or clean supply room. If the room is used for preparing patient care items, it shall contain a work counter, a handwashing station, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile supply materials, the work counter and handwashing station may be omitted. Soiled and clean workrooms or holding rooms shall be separated and have no direct connection.

c. Clean linen storage. There shall be a designated area for clean linen storage. This It may be within the clean workroom, a separate closet, or an approved distribution system on each floor. If a closed cart system is used, storage may be in an alcove. It must be out of the path of normal traffic and under staff

control.

d. Soiled workroom or soiled holding room. This room shall be separate from the clean workroom. ~~The~~ It ~~soiled workroom~~ shall contain a clinical sink (or equivalent flushing-rim fixture)~~.~~ and ~~The room shall contain~~ a ~~lavatory (or~~ handwashing station~~)~~. The above fixtures shall both have a hot and cold mixing faucet. The room shall have a work counter and space for separate covered containers for soiled linen and a variety of waste types. Rooms used only for temporary holding of soiled material may omit the clinical sink and work counter. If the flushing-rim clinical sink is eliminated, facilities for cleaning bedpans shall be provided elsewhere.

e. Nourishment station. There shall be a nourishment station with sink, work counter, refrigerator, storage cabinets, and equipment for hot and cold nourishments between scheduled meals. The nourishment station shall include space for trays and dishes used for nonscheduled meal service. Provisions and space shall be included for separate temporary storage of unused and soiled dietary trays not picked up at meal time.

f. Ice machine. ~~There~~ Equipment shall be available ~~equipment~~ to provide ice for treatments and nourishment. Ice-making equipment may be in the clean work~~-~~room or at the nourishment station. Ice intended for human consumption shall be from self-dispensing ice makers.

*g. Equipment storage room or alcove. Appropriate room(s) or alcove(s) shall be provided for storage of large items of equipment necessary for patient care and as required by the functional program. Each critical care unit shall provide sufficient storage area(s) located on the patient floor to keep its required corridor width free of all equipment and supplies, but not less than 20 square feet (1.86 square meters) per patient bed~~ shall be provided~~.

h. An x-ray viewing facility. The unit shall have an x-ray viewing facility~~be in the unit~~.

*i. Documentation and information review spaces. The requirements for documenting patient information by providers have become substantial and continue to grow. A growing number of providers and others review patient records in critical care units. Confidentiality of patient information is important. Computers are increasingly used to meet these expectations

(1) Space shall be provided within the unit to accommodate the recording of patient information. The documentation space shall be located within or adjacent to the patient bed space. It shall include countertop that will provide for a large flow sheet typical of critical care units and a computer monitor and keyboard. There shall be one documentation space with seating for each patient bed.

(2) There shall be a specifically designated area within the unit for information review within each unit and located to facilitate concentration.

7.~~3~~4.A16. The following shall be provided and may be located outside the unit if conveniently accessible.

a. ~~A v~~Visitors' waiting room. This room shall be ~~provided that is~~ designed to accommodate the long stays and stressful conditions common to such spaces, including provisions for privacy, means to facilitate communications, and access to toilets. The locations and size shall be appropriate for the number of patients and units served, with a seating capacity ~~for~~of not less than one family member ~~seating~~ per patient bed.

*b. Office space. Adequate office space immediately adjacent to the critical care unit ~~will~~ shall be available for critical care medical and nursing management/administrative personnel. ~~The offices should~~

~~be large enough to permit consulting with members of the critical care team and visitors.~~ The offices ~~will~~ shall be linked with the unit by telephone or an intercommunications system.

c. Staff lounge(s) and toilet(s). These shall be located so that staff may be recalled quickly to the patient area in emergencies. The lounge shall have telephone or intercom and emergency code alarm connections to the critical care unit it serves. If not provided elsewhere, provision for the storage of coats, etc., shall be made in this area. ~~Consideration should be given to providing a~~Adequate furnishings, equipment, and space for comfortable seating and the preparation and consumption of snacks and beverages shall be provided unless provisions have been made elsewhere. One lounge ~~may~~ shall be permitted to serve adjacent critical care areas.

d. Special procedures room. A special procedures room shall be provided if required by the functional program.

e. Staff accommodations. Sleeping and personal care accommodations shall be provided for staff on 24-hour, on-call work schedules.

f. Multipurpose room(s). Multipurpose room(s) shall be provided for staff, patients, and patients' families for patient conferences, reports, education, training sessions, and consultation. These rooms ~~must~~ shall be accessible to each nursing unit.

g. Housekeeping room. A housekeeping room shall be provided within or immediately adjacent to the critical care unit. It shall not be shared with other nursing units or departments. It shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

h. Storage space. Space to store ~~for~~ stretchers and wheelchairs shall be provided in a strategic location, without restricting normal traffic.

i. Service areas. Laboratory, radiology, respiratory therapy, and pharmacy services shall be available. These services ~~may~~ shall be permitted to be provided from the central departments or from satellite facilities as required by the functional program.

7.~~3~~4.B. Coronary Critical Care Unit
Coronary patients have special needs. They are often fully aware of their surroundings but still need immediate and critical emergency care. In addition to the standards ~~set forth~~ in Section 7.~~3~~4.A, the following standards apply to the coronary critical care unit:

7.~~3~~4.B1. Each coronary patient shall have a separate room for acoustical and visual privacy.

7.~~3~~4.B2. Each coronary patient shall have access to a toilet in the room. ~~(~~Portable commodes ~~may be used~~shall be permitted in lieu of individual toilets, but provisions must be made for their storage, servicing, and odor control.~~)~~

7.~~3~~4.C. Combined Medical/Surgical and Coronary Critical Care
If medical, surgical, and coronary critical care services are combined in one critical care unit, at least 50 percent of the beds ~~must~~ shall be located in private rooms or cubicles. ~~(**Note**: Medical/surgical patients may utilize open areas or private rooms as needed and available but, insofar as possible, coronary patients should not be accommodated in open ward areas.)~~

7.~~3~~4.D. Pediatric Critical Care
Critically ill pediatric patients have unique physical and psychological needs. ~~Not every hospital can or~~

~~should attempt to have a separate pediatric critical care unit. Many hospitals will be able to safely transfer their patients to other facilities offering appropriate services. If a facility has a specific pediatric critical care unit, the functional program must include consideration for staffing, isolation, and the safe transportation of critically ill pediatric patients, along with life support and environmental systems, from other areas. At least one airborne infection control room shall be provided, with provisions for observation of the patient. The total number of infection control rooms shall be increased based upon an Infection Control Risk Assessment. All room(s) shall comply with the requirements of Section 7.2.C.~~ If a facility has a specific pediatric critical care unit, the functional program shall include consideration for staffing, isolation, transportation, life support, and environmental systems.

In addition to the standards previously set forth for a critical care unit--general (i.e., Section 7.4.A), a pediatric critical care unit shall provide the following:

~~In addition to the standards previously listed for critical care units, each pediatric critical care unit shall include:~~

7.~~3~~4.D1. Space at each bedside for families and visitors in addition to the space provided for staff. The space provided for parental accommodations as defined by the functional program shall not limit or encroach upon the minimum clearance requirements for staff and medical equipment around the patient's bed station.

***7.~~3~~4.D2.** Sleeping space for parents who may be required to spend long hours with the patient. If the sleeping area is separate from the patient area, it ~~must~~ shall be in communication with the critical care unit ~~staff~~.

7.~~3~~4.D3. Consultation/demonstration room within, or convenient to, the pediatric critical care unit for private discussions.

***7.~~3~~4.D4.** Provisions for formula storage. ~~These may be outside the pediatric critical care unit but must be available for use at all times.~~

7.~~3~~4.D5. Separate storage cabinets or closets for toys and games ~~for use by the pediatric patients~~.

***7.~~3~~4.D6.** ~~Additional s~~Storage space (see Section 7.4.A15.g) ~~for cots, bed linens, and other items needed to accommodate parents overnight~~.

~~***7.3.D7.** Space allowance.~~

***7.~~3~~4.D~~8~~7.** Examination and treatment room(s). ~~Centrally located examination and treatment room(s) may serve more than one nursing unit, and shall be located within or immediately adjacent to each unit. Examination and treatment rooms shall have a minimum floor area of 120 square feet (11.15 square meters). The room shall contain a handwashing station; storage facilities; and a desk, counter, or shelf space for writing.~~

7.~~3~~4.E. Newborn Intensive Care Units

The following standards apply to the ~~Each~~ newborn intensive care unit (NICU) ~~shall include or comply with the following~~:

***7.~~3~~4.E1.** Entries. All entries to the NICU shall be controlled. The family entrance and reception area shall be ~~The NICU shall have a~~ clearly identified ~~entrance and reception area for families~~. The area shall permit visual observation and contact with all traffic entering the unit.

7.~~3~~4.E2. Handwashing stations. In a multiple-bed room, every bed position shall be within 20 feet (6 meters) of a hands-free handwashing station. Where an individual room concept is used, a hands-free handwashing station shall be provided within each infant care room. All ~~sinks~~ handwashing stations shall be ~~hands-free operable and~~ large enough to contain splashing.

7.~~3~~4.E3. Doors. At least one door to each patient room in the unit must be large enough in both width and height to accommodate portable x-ray and ultrasound equipment. ~~A door 44 inches (1117.6 millimeters) wide should accommodate most x ray equipment. Both width and height must be considered.~~

~~**7.3.E4.** There should be efficient and controlled access to the unit from the labor and delivery area, the emergency department, or other referral entry points.~~

7.~~3~~4.E~~5~~4. Viewing windows. When viewing windows are provided, provision shall be made to control casual viewing of infants.

~~*~~**7.~~3~~4.E~~6~~5.** Noise control. ~~In the interest of noise control, sound attenuation shall be a design factor.~~Infant bed areas and the spaces opening onto them shall be designed to produce minimal background noise and to contain and absorb much of the transient noise that arises within the NICU. The combination of continuous background sound and transient sound in any patient care area shall not exceed an hourly L_{eq} of 50 dB and an hourly L_{10} of 55 dB, both A-weighted slow response. The L_{max} (transient sounds) shall not exceed 70 dB, A-weighted slow response.

~~*~~**7.~~3~~4.E~~7~~6.** Lighting. Provisions shall be made for indirect lighting and high-intensity lighting in ~~all nurseries~~the NICU. Controls shall be provided to enable lighting to be adjusted over individual patient care spaces. Darkening sufficient for transillumination shall be available when necessary. No direct ambient lighting shall be permitted in the infant care space, and any direct ambient lighting used outside the infant care area shall be located or framed so as to avoid any infant's direct line of sight to the fixture. This does not exclude the use of direct procedure lighting. Lighting fixtures shall be easy to clean.

At least one source of daylight shall be visible from newborn care areas. External windows in infant care rooms shall be glazed with insulating glass to minimize heat gain or loss, and shall be situated at least 2 feet (0.6 meter) away from any part of a baby's bed to minimize radiant heat loss from the baby. All external windows shall be equipped with easily-cleaned shading devices that are neutral color or opaque to minimize color distortion from transmitted light.

7.~~3~~4.E~~8~~7. Control station. A central area shall serve as a control station, shall have space for counters and storage, and shall have convenient access to handwashing stations. It ~~may~~ shall be permitted to be combined with or to include centers for reception and communication and patient monitoring.

7.~~3~~4.E~~9~~8. Dimensions. Each patient care space shall contain a minimum of 120 square feet (11.2 square meters) of clear floor area per bassinet excluding sinks and aisles. ~~There shall be an aisle for circulation adjacent to each patient care space with a minimum width of 3 feet (0.91 meter).~~ There shall be an aisle adjacent to each infant care space with a minimum width of 4 feet (1.2 meters) in multiple-bed rooms. When single-patient rooms or fixed cubicle partitions are utilized in the design, there shall be an adjacent aisle of not less than 8 feet (2.4 meters) in clear and unobstructed width to permit the passage of equipment and personnel. In multiple-bed rooms, there shall be a minimum of 8 feet (2.4 meters) between infant care beds. Each ~~infant~~ patient care space shall be designed to allow privacy for the ~~baby~~ infant and family.

7.~~3~~4.E~~10~~9. Ceilings. Ceilings shall be easily cleanable and nonfriable and shall have a noise reduction

coefficient (NRC) of at least 0.90. Ceiling construction shall limit passage of particles from above the ceiling plane into the clinical environment.

7.34.E1110. Safety. The NICU shall be designed as part of an overall safety program to protect the physical security of infants, parents, and staff and to minimize the risk of infant abduction.

7.34.E1211. Airborne infection isolation room. An airborne infection isolation room is shall be required in at least one level of nursery care. The room shall be enclosed and separated from the nursery unit with provisions for observation of the infant from adjacent nurseries or control area(s). All airborne infection isolation rooms shall comply with the requirements of Section 7.2.C, except for separate toilet, bathtub, or shower.

7.34.E1312. Support spaces. Support space shall be accessible for respiratory therapy, blood gas lab, developmental therapy, social work, laboratory, pharmacy, radiology, and other ancillary services when these activities are routinely performed on the unit.

7.34.E1413. Physician's sleeping facilities with access to a toilet and shower shall be provided. If not contained within the unit itself, the area shall have a telephone or intercom connection to the patient care area.

***7.34.E1514.** Parent-infant room(s). A room(s) shall be provided within the NICU that allow(s) parents and infants extended private time together. The room(s) shall have direct, private access to sink and toilet facilities, communication linkage with the NICU staff, electrical and medical gas outlets as specified for other NICU beds, sleeping facilities for at least one parent, and sufficient space for the infant's bed and equipment. These room(s) can may be used for other purposes when they are not required for family use. The room(s) shall have electrical and medical gas outlets as specified for other NICU beds.

7.34.E1615. Dedicated sSpace shall be provided for lactation support and consultation in or immediately adjacent to the NICU. Provision shall be made, either within the room or conveniently located nearby, for handwashing stationsink, counter, refrigeration and freezing, storage for pump and attachments, and educational materials.

7.34.E1716. Charting facilities. Charting facilities shall have adequate linear surface space to ensure that staff and physicians may chart and have simultaneous access to information and communication systems.

7.34.E1817. Medication station. A Mmedication station shall be provided. See Section 7.34.A12.

***7.34.E1918**. Clean room. A Cclean workroom or clean supply room shall be provided. See Section 7.34.A.15b.

7.34.E2019. Soiled room. A Ssoiled workroom or soiled holding room shall be provided. See Section 7.34.A.15d.

7.34.E2120. Staff facilities. Provide aA lounge, locker room, and staff toilet shall be provided within or adjacent to the unit suite for staff use.

7.34.E2221. Emergency equipment storage. Space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a CPR cart. This space shall be located in an area appropriate to the functional program, but out of normal traffic.

7.34.E2322. Housekeeping room. One A housekeeping room shall be provided for the unit. It shall be

directly accessible from the unit and be dedicated for the exclusive use of the NICU~~neonatal critical care unit~~. It shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

7.~~3~~4.E~~24~~23. Space ~~should~~ shall be provided for the following:

a. ~~A v~~Visitors' waiting room. See Section 7.~~3~~4.A.16a.

b. Nurses/supervisors office or station. See Section 7.~~3~~4.A.16b.

c. Multipurpose room(s) for staff, patients, and patients' families for patient conferences, reports, education, training sessions, and consultation. These rooms must be accessible to each nursing unit. They may be on other floors if convenient for regular use. One such room may serve several nursing units and/or departments.

~~*~~7.~~4~~5 Nurseries

Infants shall be housed in nurseries that comply with the standards below. All nurseries other than pediatric nurseries shall be convenient to the postpartum nursing unit and obstetrical facilities. The nurseries shall be located and arranged to preclude the need for unrelated pedestrian traffic. No nursery shall open directly onto another nursery.

7.~~4~~5.A. General
The following standards shall apply to nurseries~~Each nursery shall contain the following~~:

7.~~4~~5.A1. At least one lavatory, equipped with a hands-free handwashing ~~station~~facility, for each eight or fewer infant stations.

7.~~4~~5.A2. Glazed observation windows to permit the viewing of infants from public areas, workrooms, and adjacent nurseries.

7.~~4~~5.A3. Convenient, accessible storage for linens and infant supplies at each nursery room.

7.~~4~~5.A4. A consultation/demonstration/breast feeding or pump room ~~shall be provided~~ convenient to the nursery. Provision shall be made, either within the room or conveniently located nearby, for ~~sink~~handwashing station, counter, refrigeration and freezing, storage for pump and attachments, and educational materials. If conveniently located, ~~The~~this ancillary area ~~provided for the unit for these purposes, when conveniently located, may~~ shall be permitted to be shared for other purposes.

7.~~4~~5.A5. Enough space ~~shall be provided~~ for parents to stay 24 hours.

7.~~4~~5.A6. An airborne infection isolation room ~~is required~~ in or near at least one level of nursery care. The room shall be enclosed and separated from the nursery unit with provisions for observation of the infant from adjacent nurseries or control area(s). All airborne infection isolation rooms shall comply with the requirements of Section 7.2.C, except for separate toilet, bathtub, or shower.

***7.~~4~~5.A7.** Workroom(s).
Each nursery room shall be served by a connecting workroom. The workroom shall contain scrubbing and gowning facilities at the entrance for staff and housekeeping personnel, work counter, refrigerator, storage for supplies, and a hands-free handwashing ~~fixture~~station. One workroom may serve more than one nursery room provided that required services are convenient to each.

The workroom serving the full-term and continuing care nurseries may be omitted if equivalent work and storage areas and facilities, including those for scrubbing and gowning, are provided within that nursery. Space required for work areas located within the nursery is in addition to the area required for infant care.

~~Adequate p~~Provision shall be made for storage of emergency cart(s) and equipment out of traffic and for the sanitary storage and disposal of soiled waste.

Visual control shall be provided via borrowed lights and/or view panels between the staff work area and each nursery.

7.~~4~~5.A8 Neonate examination and treatment areas. Such areas, when required by the functional program, shall contain a work counter, storage facilities, and a hands-free handwashing station.

7.~~4~~5.A9. Neonate formula facilities. Where infant formula is prepared on-site, direct access from the formula preparation room to any nursery room is prohibited. The room may be located near the nursery or at other appropriate locations in the hospital. The formula preparation room shall~~, but must~~ include the following:

a. Cleanup ~~facilities~~ area for washing and sterilizing supplies. This area shall include a handwashing station, facilities for bottle washing, a work counter, and sterilization equipment.

b. Separate room for preparing infant formula. This room shall contain warming facilities, refrigerator, work counter, formula sterilizer, storage facilities, and a handwashing station.

c. Refrigerated storage and warming facilities for infant formula accessible for use by nursery personnel at all times.

7.~~4~~5.A10. Commercial neonate formula. If a commercial infant formula is used, the separate cleanup and preparation rooms may be omitted. The storage and handling may be done in the nursery workroom or in another appropriate room ~~in the hospital~~ that is conveniently accessible at all hours. The preparation area shall have a work counter, a handwashing station, and storage facilities.

7.~~4~~5.A11. Housekeeping/environmental services room. A housekeeping/environmental services room shall be provided for the exclusive use of the nursery unit. It shall be directly accessible from the unit and shall contain a service sink or floor receptor and provide for storage of supplies and housekeeping equipment.

7.~~4~~5.A12. Charting space. Charting facilities shall have linear surface space to ensure that staff and physicians may chart and have simultaneous access to information and communication systems.

7,5.A13. Soiled workroom or soiled holding room. See Section 7.2.B12.

***7.~~4~~5.B. Newborn Nursery**

Each newborn nursery room shall contain no more than 16 infant stations. The minimum floor space shall be 24 square feet (2.23 square meters) per bassinet, exclusive of auxiliary work areas. When a rooming-in program is used, the total number of bassinets ~~provided~~ in these units ~~may be appropriately~~shall be permitted to be reduced, but the newborn nursery shall not be omitted in its entirety from any facility that includes delivery services. ~~(When facilities use a rooming-in program in which all infants are returned to the nursery at night, a reduction in nursery size may not be practical.)~~

~~**7.4.B1.** Baby holding nursery. Hospitals may replace traditional nurseries with baby holding nurseries i~~In postpartum and labor-delivery-recovery-postpartum (LDRP) units, a baby--holding nursery shall be permitted instead of a traditional nursery. The minimum floor area per bassinet, ventilation, electrical, and medical vacuum and gases shall be the same as that required for a full-term nursery. One bassinet shall be provided for each postpartum bed in the facility. These holding nurseries ~~should~~ shall be next to the nurse station on these units. The holding nursery shall be sized to accommodate the percentage of newborns who do not remain with their mothers during the postpartum stay.

7.~~4~~5.C. Continuing Care Nursery
For hospitals that provide continuing care for infants requiring close observation (for example, low birth-weight babies who are not ill but require more hours of nursing than do normal neonates), the minimum floor space shall be 50 square feet (4.65 square meters) per bassinet, exclusive of auxiliary work areas, with provisions for at least 4 feet (1.22 meters) between and at all sides of each bassinet. The continuing care bassinets are permitted to be within the hospital's NICU in a defined location for these infants.

7.~~4~~5.D. Pediatric Nursery
To minimize the possibility of cross--infection, each nursery room serving pediatric patients shall contain no more than eight bassinets; each bassinet shall have a minimum clear floor area of 40 square feet (3.72 square meters). Each room shall contain a ~~lavatory equipped for~~ hands-free handwashing station, a nurses emergency calling system, and a glazed viewing window for observing infants from public areas and workrooms. ~~(~~**Note**: Limitation on number of patients in a nursery room does not apply to the pediatric critical care unit.~~)~~

***7.~~5~~6 Pediatric and Adolescent Unit**

The unit shall meet the following standards:

***7.~~5~~6.A. Patient Rooms**
~~Each patient room shall meet the following standards:~~

7.~~5~~6.A1. Maximum room capacity shall be four patients.

7.~~5~~6.A2. The space requirements for pediatric patient beds shall be the same as for adult beds due to the size variation and the need to change from cribs to beds~~,~~ and vice-versa. See Section 7.2.A2 for requirements. Additional provisions for hygiene, toilets, sleeping, and personal belongings shall be ~~included~~ made where the program indicates that parents will be allowed to remain with young children. (See Sections 7.~~3~~4.D for pediatric critical care units and 7.~~4~~5 for newborn nurseries.)

7.~~5~~6.A3. Each patient room shall have a window in accordance with Section 7.~~28~~31.A10.

7.~~5~~6.B. Examination/Treatment Rooms
~~This~~ An examination/treatment room shall be provided for pediatric and adolescent patients. A separate area for infant examination and treatment ~~may be provided~~shall be permitted within the pediatric nursery workroom. Examination/treatment rooms shall have a minimum floor area of 120 square feet (11.15 square meters). The room shall contain a handwashing station; storage facilities; and a desk, counter, or shelf space for writing.

7.~~5~~6.C. Service Areas
The service areas in the pediatric and adolescent nursing units shall conform to Section 7.2.B and shall also meet the following standards:

7.~~5~~6.C1. Multipurpose or individual room(s) shall be provided within or adjacent to areas serving pediatric and adolescent patrons for dining, education, and developmentally appropriate play and recreation, with access and equipment for patients with physical restrictions. If the functional program requires, an individual room shall be provided to allow for confidential parent/family comfort, consultation, and teaching. Insulation, isolation, and structural provisions shall minimize the transmission of impact noise through the floor, walls, or ceiling of the~~se~~ multipurpose room(s).

7.~~5~~6.C2. Space for preparation and storage of infant formula shall be provided within the unit or other convenient location. Provisions shall be made for continuation of special formula that may have been prescribed for the infant prior to admission or readmission.

7.~~5~~6.C3. Patient toilet room(s) with handwashing station(s) in each room, in addition to those serving bed areas, shall be convenient~~ly located~~ to multipurpose room(s) and to each central bathing facility.

7.~~5~~6.C4. Storage closets or cabinets shall be provided for toys, educational, and recreational equipment ~~shall be provided~~.

7.~~5~~6.C5. Storage space shall be provided to permit exchange of cribs and adult beds. Provisions shall also be made for storage of equipment and supplies (including cots or recliners, extra linen, etc.) for parents who stay with the patient overnight.

7.~~5~~6.C6. At least one airborne infection isolation room shall be provided in each pediatric unit. The total number of infection isolation rooms shall be determined by an ~~Infection Control Risk Assessment~~ICRA. Airborne infection isolation room(s) shall comply with the requirements of Section 7.2.C.

7.~~5~~6.C7. Separate clean and soiled workrooms or holding rooms shall be provided as described in Sections 7.2.B11 and 12.

7.~~6~~7 Psychiatric Nursing Unit

~~When part of a general hospital, these units shall be designed for the care of inpatients. Nonambulatory inpatients may be treated in a medical unit until their medical condition allows for transfer to the psychiatric nursing unit.~~ See Section 7.2.E for psychiatric care in a medical unit. Provisions shall be made in the design for adapting the area for various types of medical and psychiatric therapies as described in the approved functional program.

The facility shall provide a therapeutic environment appropriate for the planned treatment programs. Security appropriate for the planned treatment programs shall be provided. In no case shall adult and pediatric clients be mixed. This does not exclude sharing of nursing stations or support areas, as long as the separation and safety of the units can be maintained.

A safe environment is critical; however, no environment can be entirely safe and free of risk. The majority of persons who attempt suicide suffer from a treatable mental disorder or a substance abuse disorder or both. Patients of inpatient psychiatric treatment facilities are considered at high risk for suicide; the environment should avoid physical hazards while maintaining a therapeutic environment. The built environment, no matter how well designed and constructed, cannot be relied upon as an absolute preventative measure. Staff awareness of their environment, latent risks of that environment, and the behavior risks and needs of the patients served in the environment are absolute necessities. Different organizations and different patient populations will require greater or lesser tolerance for risk.

The facility should provide a therapeutic environment appropriate for the planned treatment programs. The environment should be characterized by a feeling of openness with emphasis on natural light. In every aspect of building design and maintenance it is essential to make determinations based on the potential risk to the specific patient population served.

Consideration should be given to visual control (including electronic surveillance) on nursing units of corridors, dining areas, and social areas such as dayrooms and activities areas. Hidden alcoves or blind corners or areas should be avoided.

The openness of the nurse station will be dependant on the planned treatment program. Consideration should be given to patient privacy and also to staff safety.

The guidelines noted in Sections 11.1 through 11.3, shall apply, with the following exceptions:

- The patient room size shall meet the requirements in Section 7.2.A2.
- Adequate storage shall meet the requirements in Section 7.2.A7.
- A desk or writing surface for patient use may be provided in each room, but this is not required.
- A quiet room is not required on units of 12 beds or fewer unless required by the functional program.
- The functional needs of the program shall determine the need for a nurse call system. If a nurse call system is provided, it shall meet the requirements of Section 7.35.G. However, provisions shall be made for easy removal or covering of the call system.
- Visual privacy in multibed rooms(e.g., cubicle curtains) is not required.
- The functional needs of the program will determine the need for medical gas and/or vacuum systems. If a medical gas/vacuum system is provided, it shall meet the requirements of Section 7.32.E5. However, provisions shall be made for easy removal and/or covering of the medical gas/vacuum system.

7.7.A. Patient Rooms
See Section 11.2.A.

7.7.B. Support Areas
See Section 11.2.B.

7.7.C. Seclusion Treatment Rooms
See Section 11.2.C.

~~The environment of the unit should be characterized by a feeling of openness with emphasis on natural light and exterior views. Various functions should be accessible from common areas while not compromising desirable levels of patient privacy. Interior finishes, lighting, and furnishings should suggest a residential rather than an institutional setting. These should, however, conform with applicable fire safety codes. Security and safety devices should not be presented in a manner to attract or challenge tampering by patients.~~

~~Where glass fragments pose a hazard to certain patients, safety glazing and/or other appropriate security features shall be used.~~

~~Details of such facilities should be as described in the approved functional program. Each nursing unit shall provide the following:~~

~~**7.6.A. Patient Rooms**~~
~~The standard noted in Section 7.2.A shall apply to patient rooms in psychiatric nursing units *except* as~~

follows:

7.6.A1. A nurses call system is not required, but if it is included, provisions shall be made for easy removal, or for covering call button outlets.

7.6.A2. Bedpan flushing devices may be omitted from patient room toilets in psychiatric nursing units.

7.6.A3. Handwashing stations are not required in patient rooms.

7.6.A4. Visual privacy in multibed rooms (e.g., cubicle curtains) is not required.

7.6.A5. The ceiling and the air distribution devices, lighting fixtures, sprinkler heads, and other appurtenances shall be of a tamper-resistant type.

7.6.A6. Each patient room shall be provided with a private toilet that meets the following requirements:

a. The door shall not be lockable from within.

b. The door shall be capable of swinging outward.

c. The ceiling shall be of tamper-resistant construction, and the air distribution devices, lighting fixtures, sprinkler heads, and other appurtenances shall be of the tamper-resistant type.

7.6.B. Service Areas
The standards noted in Section 7.2.B shall apply to service areas for psychiatric nursing units with the following modifications:

7.6.B1. A secured storage area shall be provided for patients' belongings that are determined to be potentially harmful (e.g., razors, nail files, cigarette lighters); this area will be controlled by staff.

7.6.B2. Medication station shall include provisions for security against unauthorized access.

7.6.B3. Food service within the unit may be one, or a combination, of the following:

a. A nourishment station.

b. A kitchenette designed for patient use with staff control of heating and cooking devices.

c. A kitchen service within the unit including a handwashing station, storage space, refrigerator, and facilities for meal preparation.

7.6.B4. Storage space for stretchers and wheelchairs may be outside the psychiatric unit, provided that provisions are made for convenient access as needed for disabled patients.

7.6.B5. In psychiatric nursing units, a bathtub or shower shall be provided for each six beds not otherwise served by bathing facilities within the patient rooms. Bathing facilities should be designed and located for patient convenience and privacy.

7.6.B6. A separate charting area shall be provided with provisions for acoustical privacy. A viewing window to permit observation of patient areas by the charting nurse or physician may be used if the arrangement is such that patient files cannot be read from outside the charting space.

~~**7.6.B7.** At least two separate social spaces, one appropriate for noisy activities and one for quiet activities, shall be provided. The combined area shall be at least 40 square feet (3.72 square meters) per patient with at least 120 square feet (11.15 square meters) for each of the two spaces. This space may be shared by dining activities.~~

~~**7.6.B8.** Space for group therapy shall be provided. This may be combined with the quiet space noted above when the unit accommodates not more than 12 patients, and when at least 225 square feet (20.90 square meters) of enclosed private space is available for group therapy activities.~~

~~**7.6.B9.** Patient laundry facilities with an automatic washer and dryer shall be provided.~~

~~The following elements shall also be provided, but may be either within the psychiatric unit or immediately accessible to it unless otherwise dictated by the program:~~

~~**7.6.B10.** Room(s) for examination and treatment with a minimum area of 120 square feet (11.15 square meters). Examination and treatment room(s) for medical surgical patients may be shared by the psychiatric unit patients. (These may be on a different floor if conveniently accessible.)~~

~~**7.6.B11.** Separate consultation room(s) with minimum floor space of 100 square feet (9.29 square meters) each, provided at a room to bed ratio of one consultation room for each 12 psychiatric beds. The room(s) shall be designed for acoustical and visual privacy and constructed to achieve a noise reduction of at least 45 decibels.~~

~~**7.6.B12.** Psychiatric units each containing 15 square feet (1.39 square meters) of separate space per patient for patient therapy/multipurpose use, with a minimum total area of at least 200 square feet (18.58 square meters), whichever is greater. Space shall include provision for handwashing, work counter(s), storage, and displays. This space may serve more than one nursing unit. When psychiatric nursing unit(s) contain less than 12 beds, the therapy and other functions may be performed within the noisy activities area, if at least an additional 10 square feet (0.93 square meter) per patient served is included.~~

~~**7.6.B13.** A conference and treatment planning room for use by the psychiatric unit.~~

~~**7.6.C. Seclusion Treatment Room**~~
~~There shall be at least one seclusion room for up to 24 beds or a major fraction thereof. If a facility has more than one psychiatric nursing unit, the number of seclusion rooms shall be a function of the total number of psychiatric beds in the facility. Seclusion rooms may be grouped together.~~

~~The seclusion treatment room is intended for short-term occupancy by a violent or suicidal patient. Within the psychiatric nursing unit, this space provides for patients requiring security and protection. The room(s) shall be located for direct nursing staff supervision. Each room shall be for only one patient. It shall have an area of at least 60 square feet (5.57 square meters) and shall be constructed to prevent patient hiding, escape, injury, or suicide. Where restraint beds are required by the functional program, 80 square feet (7.43 square meters) shall be required.~~

~~Room doors shall be designed with hardware that will permit the doors to swing out. Outside corners shall be omitted where possible. The ceiling shall be of tamper-resistant construction and the air distribution devices, lighting fixtures, sprinkler heads, and other appurtenances shall be of the tamper-resistant type. The walls shall be completely free of objects. Special fixtures and hardware for electrical circuits shall be used. Minimum ceiling height shall be 9 feet (2.74 meters). Doors shall be 3 feet 8 inches (1.12 meters) wide and shall permit staff observation of the patient while also maintaining provisions for~~

~~patient privacy. Seclusion treatment rooms shall be accessed by an anteroom or vestibule that also provides direct access to a toilet room. The toilet room and anteroom shall be large enough to safely manage the patient.~~

~~Where the interior of the seclusion treatment room is padded with combustible materials, these materials shall be of a type acceptable to the local authority having jurisdiction. The room area, including floor, walls, ceilings, and all openings, shall be protected with not less than one-hour-rated construction.~~

7.8 In-Hospital Skilled Nursing Units

Note: Many facilities have incorporated in-hospital skilled nursing units for patients requiring skilled nursing care as part of their recovery process. Many of these facilities are intended for elderly patients undergoing various levels of rehabilitation, and recuperating stroke victims or brain trauma victims requiring rehabilitation. The basic requirements contained in Section 7.2.A apply and shall be supplemented with the following requirements.

7.8.A. The location shall provide convenient access to the Physical and Rehabilitation Medicine Departments.

7.8.B. The unit shall be located to exclude unrelated traffic going through the unit to access other areas of the hospital.

7.8.C. Wherever possible, the unit shall be located to provide access to outdoor spaces that can be utilized for therapeutic purposes.

7.8.D. In addition to the general spaces required under Section 7.2.B, the following rooms and support elements shall be provided:

7.8.D1. A living dining recreation space(or spaces) shall be provided within the nursing unit and shall have a minimum aggregate square footage of 25 square feet (7.62 square meters) per bed.

7.8.D2. A room for patient grooming shall be provided with spaces for hair-washing stations, hair clipping and hair styling, in addition to other grooming needs. A handwashing station, mirror, work counters, storage shelving, and sitting areas for patients shall be provided as part of the room. The minimum area shall not be part of the aggregate area under Section 7.8.D.1 and shall be as determined by the facility program.

7.8.D3. A physical rehabilitation room shall be provided for the use of the skilled nursing unit if the unit is not located adjacent to the facility's physical and rehabilitation therapy departments. The room size and the equipment provided shall be adequate to provide the therapeutic milieu required by the facility's narrative program.

7.8.D4. When required by the narrative program, the unit shall contain private living space for the use of individual patients, family, and caregivers to discuss the specific patients needs, or private family matters. It shall have a minimum square foot of 250 square feet (76.20 square meters) of clear area and is permitted to be considered part of the square footage per bed outlined in Section 7.8.D1.

7.8.D5. Handrails located in accordance with ADA and all local, state, and federal requirements shall be installed on both sides of the patient use corridor for the use of the patients during the daytime.

7.8.D6. Additional storage spaces to accommodate the increase in wheelchair and walking aids used by this patient population shall be included in the design of the unit, with an additional square footage of 7 square feet (2.13 square meters) per bed.

***7.~~7~~9 ~~Surgical Suites~~Surgery**

~~**Note:**~~ The number of operating rooms and recovery beds and the sizes of the service areas shall be based on the expected surgical workload. In the program, the size, location, and configuration of the surgical

suite and support service departments shall reflect the projected volume of outpatients. This may be achieved by designing either an outpatient surgery facility or a combined inpatient-outpatient surgical suite. The surgical suite shall be located and arranged to prevent nonrelated traffic through the suite. When outpatient surgery is provided in the surgical suite of the hospital facility, it shall comply with the requirements for outpatient surgery in Section 7.10. When outpatient surgery and PACU is provided in a separate unit of the hospital facility or in a separate facility, it shall comply with the requirements for outpatient surgery in Section 9.6.

When bronchoscopy is performed on persons who are known or suspected of having pulmonary tuberculosis, the procedure room shall meet the airborne infection isolation room ventilation requirements.

When invasive procedures are performed on persons who are known or suspected of having airborne infectious disease, these procedures should not be performed in the operating suite. They shall be performed in a room meeting airborne infection isolation ventilation requirements or in a space using local exhaust ventilation. If the procedure must be performed in the operating suite, see the [okay here] "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities."[move to appendix]

Additions to, and adaptations of, the following elements shall be made for the special-procedure operating rooms found in larger facilities.

The following shall be provided:

7.79.A. SurgerySurgical Suites
The clinical practice setting shall be designed to facilitate movement of patients and personnel into, through, and out of defined areas within the surgical suite. Signs shall clearly indicate the surgical attire required.

The surgical suite shall be divided into three designated areas—unrestricted, semirestricted, and restricted—that are defined by the physical activities performed in each area.

7.89.A1. Unrestricted area. The unrestricted area includes a central control point established to monitor the entrance of patients, personnel, and materials. Street clothes are permitted in this area, and traffic is not limited.

7.89.A2. Semirestricted area. The semirestricted area includes the peripheral support areas of the surgical suite. It and has storage areas for clean and sterile supplies, work areas for storage and processing of instruments, and corridors leading to the restricted areas of the surgical suite. Traffic in this area is limited to authorized personnel and patients. Personnel are required to wear surgical attire and cover all head and facial hair.

7.89.A3. Restricted area. The restricted area includes operating and procedure rooms, the clean core, and scrub sink areas. Surgical attire and hair coverings are required. Masks are required where open sterile supplies or scrubbed persons may be located.

***7.9.B. Operating and Procedure Rooms**

***7.79.AB1.** General operating room(s). In new construction, each room shall have a minimum clear area of 400 square feet (37.16 square meters) exclusive of fixed or wall-mounted cabinets and built-in shelves, with a minimum of 20 feet (6.10 meters) clear dimension between fixed cabinets and built-in shelves; and

a system for emergency communication with the surgical suite control station. X-ray film ~~illuminators~~ viewers for handling at least four films simultaneously or digital image viewers shall ~~also~~ be provided. Where renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above square-foot standards, ~~the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases,~~ each room shall have a minimum clear area of 360 square feet (33.45 square meters), exclusive of fixed or wall-mounted cabinets and built-in shelves, with a minimum of 18 feet (5.49 meters) clear dimension between fixed cabinets and built-in shelves. ~~(For renovation projects, see Section 7.7.AB6.)~~

7.~~7~~9.~~A~~B2. Room(s) for cardiovascular, orthopedic, neurological, and other special procedures that require additional personnel and/or large equipment.

a. When included, this room shall have, in addition to the above, a minimum clear area of 600 square feet (55.74 square meters), with a minimum of 20 feet (6.10 meters) clear dimension exclusive of fixed or wall-mounted cabinets and built-in shelves.

b. ~~When~~ Where open-heart surgery is performed, an additional room in the restricted area of the surgical suite, preferably adjoining this operating room, shall be designated as a pump room where extra corporeal pump(s), supplies, and accessories are stored and serviced.

c. ~~When~~ Where complex orthopedic and neurosurgical surgery is performed, additional rooms shall be in the restricted area of the surgical suite, preferably adjoining the specialty operating rooms, which shall be designated as equipment storage rooms for the large equipment used to support these procedures.

d. Appropriate plumbing and electrical connections shall be provided in the cardiovascular, orthopedic, neurosurgical, pump, and storage rooms.

e. Where renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above square-foot standards, ~~the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases,~~ orthopedic surgical rooms ~~may~~ shall have a minimum clear area of 360 square feet (33.5 square meters), ~~and~~with a minimum dimension of 18 feet (5 meters). Rooms for cardiovascular, neurological, and other special procedures ~~may~~ shall have a minimum clear area of 400 square feet (44.39 square meters).

7.~~7~~9.~~A~~B3. A room for orthopedic surgery. ~~When~~ Where included, this room shall, in addition to the above, have enclosed storage space for splints and traction equipment. Storage may be outside the operating room but must be conveniently located. If a sink is used for the disposal of plaster of Paris, a plaster trap shall be provided.

7.~~7~~9.~~A~~B4. Room(s) for surgical cystoscopic and other endo-urologic procedures. This room shall have a minimum clear area of 350 square feet (32.52 square meters) exclusive of fixed or wall-mounted cabinets and built-in shelves, with a minimum of 15 feet (4.57 meters) clear dimension between fixed cabinets and built-in shelves. X-ray viewing capability to accommodate at least four films simultaneously ~~will~~ shall be provided. In renovation projects, rooms for surgical cystoscopy may have a minimum clear area of 250 square feet (23.28 square meters).

7.~~7~~9.~~A~~B5. Endoscopy suite ~~requirements~~. (See Section 9.9.)

~~**7.7.A6.** The functional program may require additional clear space, plumbing, and mechanical facilities to accommodate special functions in one or more of these rooms. When existing functioning operating rooms are modified, and it is impractical to increase the square foot area because of walls or structural~~

~~members, the operating room may continue in use when requested by the hospital.~~

7.9.B6. Operating room perimeter walls, ceiling, and floors, including penetrations, shall be sealed. (See Glossary.)

7.~~7~~9.~~B~~C. Pre- and Postoperative Holding Areas

7.~~7~~9.~~B~~C1. Preoperative patient holding area(s). In facilities with two or more operating rooms, areas shall be provided to accommodate stretcher patients as well as sitting space for ambulatory patients ~~not requiring stretchers~~. These areas shall be under the direct visual control of the nursing staff and may be part of the recovery suite to achieve maximum flexibility in managing surgical case~~-~~loads. Each stretcher station shall be a minimum of 80 square feet (7.43 square meters) exclusive of general circulation space through the ward and shall have a minimum clearance of 4 feet (1.22 meters) on the sides of the stretchers and the foot of the stretchers. Provisions shall be made for the isolation of infectious patients. Provisions ~~for patient privacy~~ such as cubicle curtains shall be made for patient privacy.

***7.~~7~~9.~~B~~C2.** Post-anesthetic care units (PACUs). Each PACU shall contain a medication station; handwashing stations; nurse station with charting facilities; clinical sink; provisions for bedpan cleaning; and storage space for stretchers, supplies, and equipment. Additionally, the design shall provide a minimum of 80 square feet (7.43 square meters) for each patient bed, exclusive of general circulation space within the PACU, with a space for additional equipment described in the functional program, and for clearance of at least 5 feet (1.52 meters) between patient beds and 4 feet (1.22 meters) between patient bedsides and adjacent walls. Provisions shall be made for the isolation of infectious patients. Provisions ~~for patient privacy~~ such as cubicle curtains shall be made for patient privacy. In new construction, at least one door to the recovery room shall provide access directly from the surgical suite without crossing public hospital corridors.

a. An airborne infection isolation room is not required in a PACU. Provisions for the recovery of a potentially infectious patient with an airborne infection shall be determined by ~~the~~ an ICRA ~~Infection Control Risk Assessment~~.

b. A staff toilet shall be located within the working area to maintain staff availability to patients.

c. At least one ~~H~~handwashing station~~s~~ with hands-free operable controls shall be available ~~with at least one~~ for every four beds, uniformly distributed to provide equal access from each ~~patient~~ bed.

7.~~7~~9.~~C~~D. Service Areas

Services, except for the enclosed soiled workroom mentioned in ~~item~~ Section 7.~~7~~9.~~C~~D6 and the housekeeping room in ~~item~~ Section 7.~~7~~9.~~C~~D19, may be shared with the obstetrical facilities in accordance with ~~if~~ the functional program ~~reflects this concept~~. Service areas, ~~when~~ where shared with delivery rooms, shall be designed to avoid the passing of patients or staff between the operating room and the delivery room areas. The following ~~services~~ shall be provided:

7.~~7~~9.~~C~~D1. A control station located to permit visual observation of all traffic into the suite.

7.~~7~~9.~~C~~D2. A supervisor's office or station. The number of offices, stations, and teaching areas in the surgical suite shall depend upon the functional program.

7.~~7~~9.~~C~~D3. A substerile areas(s). This area acts as a service area between two or more operating or procedure rooms. It ~~and~~ shall be equipped with a flash sterilizer, warming cabinet, sterile supply storage area, and handwashing station with hands-free controls. A sterilizing facility(ies) with high-speed

sterilizer(s) or other sterilizing equipment for immediate or emergency use ~~must~~ shall be grouped to service several operating rooms for convenient, efficient use. A work space and handwashing station ~~may~~ shall be ~~included~~provided if required by the functional program. Other facilities for processing and sterilizing reusable instruments, etc., ~~may be~~are typically located in another hospital department, such as central services.

7.~~7~~9.~~C~~D4. Medication station. Provision shall be made for storage and distribution of drugs and routine medications. This may be done from a medicine preparation room or unit, from a self-contained medicine-dispensing unit, or by another system. If used, a medicine preparation room or unit shall be under visual control of nursing staff. It shall contain a work counter, sink, refrigerator, and double-locked storage for controlled substances. Convenient access to handwashing stations shall be provided. (Standard cup-sinks provided in many self-contained units are not adequate for handwashing.)

7.~~7~~9.~~C~~D5. Scrub facilities. Two scrub positions shall be provided near the entrance to each operating room. Two scrub positions may serve two operating rooms if both positions are ~~located~~ adjacent to the entrance of each operating room. Scrub facilities ~~should~~ shall be arranged to minimize incidental splatter on nearby personnel, medical equipment, or supply carts. In new construction, view windows at scrub stations permitting observation of room interiors ~~should~~ shall be provided. The scrub sinks ~~should~~ shall be recessed into an alcove out of the main traffic areas. The alcove shall be located off the semirestricted or restricted areas of the surgical suite. Scrub sinks shall be located outside the sterile core.

7.~~7~~9.~~C~~D6. An enclosed soiled workroom (or soiled holding room that is part of a system for the collection and disposal of soiled material) for the exclusive use of the surgical suite ~~shall be provided~~. It shall be located in the restricted area. The soiled workroom shall contain a flushing-rim clinical sink or equivalent flushing-rim fixture, a handwashing station, a work counter, and space for waste receptacles and soiled linen receptacles. Rooms used only for temporary holding of soiled material may omit the flushing-rim clinical sink and work counters. However, if the flushing-rim clinical sink is omitted, other provisions for disposal of liquid waste shall be provided. The room shall not have direct connection with operating rooms or other sterile activity rooms. Soiled and clean workrooms or holding rooms shall be separated.

7.~~7~~9.D~~C~~7. Clean workroom or clean supply room. This room ~~should~~ shall not be used for food preparation.

a. A clean workroom ~~is required~~ shall be provided when clean materials are assembled within the surgical suite prior to use or following the decontamination cycle. It shall contain a work counter, a handwashing station, storage facilities for clean supplies, and a space to package reusable items. The storage for sterile supplies must be separated from this space. If the room is used only for storage and holding as part of a system for distribution of clean and sterile supply materials, the work counter and handwashing station may be omitted. Soiled and clean workrooms or holding rooms shall be separated.

b. Storage space for sterile and clean supplies ~~should~~ shall be ~~adequate for~~ sized to meet the functional plan. The space ~~should~~ shall be moisture and temperature controlled and free from cross-traffic.

c. An operating room suite design with a sterile core ~~must~~ shall provide for no cross-traffic of staff and supplies from the decontaminated/soiled areas to the sterile/clean areas. The use of facilities outside the operating room for soiled/decontaminated processing and clean assembly and sterile processing ~~will~~ shall be designed to move the flow of goods and personnel from dirty to clean/sterile without compromising universal precautions or aseptic techniques in both departments.

7.~~7~~9.D~~C~~8. Medical gas storage facilities. Main storage of medical gases may be outside or inside the

facility in accordance with NFPA 99. Provision shall be made for additional separate storage of reserve gas cylinders necessary to complete at least one day's procedures.

7.~~7~~9.D~~C~~9. The anesthesia workroom for cleaning, testing, and storing anesthesia equipment shall contain work counter(s) and sink(s) and racks for cylinders. Provisions shall be made for separate storage of clean and soiled items. In new construction, depending on the functional and space programs, the anesthesia workroom ~~should~~ shall provide space for anesthesia case carts and other anesthesia equipment.

***7.~~7~~9.D~~C~~10.** Equipment storage room(s) for equipment and supplies used in surgical suite. Each surgical suite shall provide sufficient storage area to keep its required corridor width free of equipment and supplies, but not less than 150 square feet (13.94 square meters) or 50 square feet (4.65 square meters) per ~~Or~~operating room, whichever is greater.

7.~~7~~8.9D~~C~~11. Staff clothing change areas. Appropriate areas shall be provided for male and female personnel (orderlies, technicians, nurses, and doctors) working within the surgical suite. The areas shall contain lockers, showers, toilets, ~~lavatories equipped for~~ handwashing stations, and space for donning surgical attire. These areas shall be arranged to encourage a one-way traffic pattern so that personnel entering from outside the surgical suite can change and move directly into the surgical suite.

7.~~7~~9.D~~C~~12. Staff lounge and toilet facilities. Separate or combined lounges ~~for male and female staff~~ shall be provided for male and female staff. Lounge(s) shall be designed to minimize the need to leave the suite and to provide convenient access to the recovery room.

7.~~7~~9.D~~C~~13. Dictation and report preparation area. ~~This~~ It may be accessible from the lounge area.

7.~~7~~9.D~~C~~14. Phase II recovery. Where outpatient surgeries are to be part of the surgical suite, and where outpatients receive Class B or Class C sedation, a ~~second~~ separate Phase II or step-down recovery room shall be provided. The room shall contain handwashing stations, a nurse station with charting facilities, clinical sink, provision for bedpan cleaning, and storage space for supplies and equipment. In addition, the design shall provide a minimum of 50 square feet (4.65 square meters) for each patient in a lounge chair, with space for additional equipment described in the functional program and for clearance of 4 feet (1.22 meters) ~~between~~ on the sides of the lounge chairs and the foot of the lounge chairs. Provisions shall be made for the isolation of infectious patients. Provisions ~~for patient privacy~~ such as cubicle curtains shall be made for patient privacy. In new construction, at least one door shall access the PACU without crossing unrestricted corridors of the hospital. A minimum clear floor area of 100 square feet (30.48 square meters) shall be provided in single-bed rooms. A handwashing station shall be provided in each room.

a. A patient toilet shall be provided with direct access to the Phase II recovery unit for the exclusive use of patients.

b. A staff toilet shall be provided with direct access to the working area to maintain staff availability to patients.

c. At least one ~~H~~handwashing station~~s~~ with hands-free operable controls shall be provided ~~available with at least one~~ for every four lounge chairs, uniformly distributed to provide equal access from each ~~patient bed~~lounge chair.

7.~~7~~9.D~~C~~15. Change areas for outpatients and same-day admissions. If the functional program defines outpatient surgery as part of the surgical suite, a separate area shall be provided where outpatients may change from street clothing into hospital gowns and be prepared for surgery. ~~This would~~It shall include a

waiting room, locker(s), toilet(s), and clothing change or gowning area. Where private holding room(s) or cubicle(s) are provided, a separate change area is not required.~~Changing may also be accommodated in a private holding room or cubicle.~~

7.~~7~~9.D~~C~~16. Provisions ~~shall be made~~ for patient examination, interviews, preparation, testing, and obtaining vital signs of patients for outpatient surgery.

7.~~7~~9.D~~C~~17. Patient holding area. In facilities with two or more operating rooms, an area shall be provided to accommodate stretcher patients waiting for surgery. This holding area shall be under the visual control of the nursing staff.

7.~~7~~9.D~~C~~18. Storage areas for portable x-ray equipment, stretchers, fracture tables, warming devices, auxiliary lamps, etc. These areas shall be out of corridors and traffic.

7.~~7~~9.D~~C~~19. Housekeeping facilities. Housekeeping facilities shall be provided for the exclusive use of the surgical suite. ~~It~~They shall be directly accessible from the suite and shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

7.~~7~~9.D~~C~~20. Area for preparation and examination of frozen sections. This area may be part of the general laboratory if immediate results are obtainable without unnecessary delay in the completion of surgery.

7.~~7~~9.D~~C~~21. Ice machine. An ice machine shall be provided to provide ice for treatments and patient use. Ice intended for human consumption shall be from self-dispensing ice makers.

7.~~7~~9.D~~C~~22. Provisions for refrigerated blood bank storage that meets the standards of the American Blood Banking Association.

7.~~7~~9.D~~C~~23. Where applicable, ~~appropriate provisions for~~ refrigeration facilities for harvested organs.

7.~~7~~9.D~~C~~24. Provisions for pathological specimens storage prior to transfer to pathology section.

7.~~7~~9.D~~C~~25. Separate outpatient surgical unit. See Section 9.5~~of this document concerning the separate outpatient surgical unit~~.

*7.~~8~~10 Obstetrical Facilities

A newborn nursery shall be provided~~is required~~. See Section 7.~~4~~5.

7.~~8~~10.A. Obstetrical Suite

7.~~8~~10.A1. General. The obstetrical unit shall be located and designed to prohibit non-related traffic through the unit. When delivery and operating rooms are in the same suite, access and service arrangements shall be such that neither staff nor patients need to travel through one area to reach the other. Except as permitted otherwise herein, existing facilities being renovated shall, as far as practicable, provide all the required support services.

7.~~8~~10.A2. Postpartum unit

a. Postpartum bedroom.

(1) A postpartum bedroom shall have a minimum of 100 square feet (9.29 square meters) of clear floor

area per bed in multiple-bed~~ded~~ rooms and 120 square feet (11.15 square meters) of clear floor area in single-bed~~ded~~ rooms. These areas shall be exclusive of toilet rooms, closets, alcoves, or vestibules. Where renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above square-foot standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, existing postpartum patient rooms shall have no less than 80 square feet (7.43 square meters) of clear floor area per bed in multiple-bed rooms and 100 square feet (9.29 square meters) in single-bed rooms.

(2) In multiple-bed~~ded~~ rooms, there shall be a minimum clear distance of 4 feet (1.22 meters) between the foot of the bed and the opposite wall, 3 feet (0.91 meter) between the side of the bed and the nearest wall, and 4 feet (1.22 meters) between beds.

*(3) The maximum number of beds per room shall be two.

(4) Each patient bedroom shall have a window in accordance with Section 7.31.A10~~or windows~~.

(5) Handwashing stations shall be provided in each patient bedroom. In multiple-bed~~ded~~ rooms, the handwashing station shall be located outside of the patients' cubicle curtains so that it is accessible to staff.

(6) Each patient shall have access to a toilet room or bathroom with handwashing stations without entering a general corridor. One such room shall serve no more than two beds and no more than two patient rooms.

b. The following support services ~~for this unit~~ shall be provided for this unit.

(1) A nurse station.

(2) A nurse office.

(3) Charting facilities.

(4) Toilet room for staff.

(5) Staff lounge.

(6) Lockable closets or cabinets for personal articles of staff.

(7) Consultation/conference room(s).

(8) Patients' lounge. The patients' lounge may be omitted if all rooms are single-bed~~ded~~ rooms.

(9) Clean workroom or clean supply room. A clean workroom is required if clean materials are assembled within the obstetrical suite prior to use. It shall contain a work counter, a handwashing station, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile supply materials, the work counter and handwashing stations may be omitted. Soiled and clean workrooms or holding rooms shall be separated and have no direct connection.

(10) Soiled workroom or soiled holding room for the exclusive use of the obstetrical suite. This room shall be separate from the clean workroom~~. The soiled workroom~~ and shall contain a clinical sink (or equivalent flushing-rim fixture) and a handwashing station. The above fixtures shall both have a hot and

cold mixing faucet. The room shall have a work counter and space for separate covered containers for soiled linen and waste. Rooms used only for temporary holding of soiled material may omit the clinical sink and work counter. If the flushing-rim clinical sink is omitted, facilities for cleaning bedpans shall be provided elsewhere.

(11) Medication station. Provision shall be made for storage and distribution of drugs and routine medications. This may be done from a medicine preparation room or unit, from a self-contained medicine-~~-~~dispensing unit, or by another system. If used, a medicine preparation room or unit shall be under visual control of nursing staff. It shall contain a work counter, sink, refrigerator, and double-locked storage for controlled substances. Convenient access to handwashing stations shall be provided. (Standard cup-sinks provided in many self-contained units are not adequate for handwashing.)

(12) Clean linen storage. This may be part of a clean workroom or a separate closet. When a closed cart system is used, the cart may be stored in an alcove out of the path of normal traffic.

(13) Nourishment station. The nourishment station shall contain a sink, work counter, ice dispenser, refrigerator, cabinets, and equipment for serving hot or cold food. Space shall be included for temporary holding of unused or soiled dietary trays.

(14) Equipment storage room. Each unit shall provide sufficient storage area(s) ~~located~~ on the patient floor to keep its required corridor width free of equipment and supplies. This storage area shall be~~, but~~ not less than 10 square feet (0.93 square meter) per postpartum room and 20 square feet (1.86 square meters) per each LDR or LDRP room. ~~outside of the patient room.~~This storage area shall be in addition to any storage in patient rooms.

(15) Storage space for stretchers and wheelchairs. Storage space for stretchers and wheelchairs shall be provided in a strategic location, out of corridors and away from normal traffic.

(16) Bathing facilities. ~~When~~Where bathing facilities are not provided in patient rooms, there shall be at least one shower and/or bathtub for each six beds or fraction thereof. Handwashing and private toilet facilities shall be available without entering the corridor.

(17) Housekeeping room. A housekeeping room shall be provided for the exclusive use of the obstetrical suite. It shall be directly accessible from the suite and shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

(18) Examination/treatment room and/or multipurpose diagnostic testing room. This room shall have a minimum clear floor area of 120 square feet (11.15 square meters). When ~~utilized~~ used as a multi-patient diagnostic testing room, a minimum clear floor area of 80 square feet (7.43 square meters) per patient shall be provided. An adjoining toilet room shall be provided for patient use.

(19) Emergency equipment storage. Storage shall be ~~located in~~ close ~~proximity~~ to the nurse station.

c. Airborne infection isolation room(s). An airborne infection isolation room is not required for the obstetrical unit. Provisions for the care of the perinatal patient with an airborne infection shall be determined by ~~the Infection Control Risk Assessment~~an ICRA.

7. ~~8~~10~~.~~A3. Cesarean/Delivery Suite

a. Cesarean/delivery room(s) shall have a minimum clear floor area of 360 square feet (33.45 square meters) with a minimum dimension of 16 feet (4.88 meters), exclusive of built-in shelves or cabinets.

There shall be a minimum of one such room in every obstetrical unit.

b. Delivery room(s) shall have a minimum clear area of 300 square feet (27.87 square meters), exclusive of fixed cabinets and built-in shelves. An emergency communication system shall be connected with the obstetrical suite control station.

c. Infant resuscitation shall be provided within the cesarean/delivery room(s) and delivery rooms with a minimum clear floor area of 40 square feet (3.72 square meters) in addition to the required area of each room or may be provided in a separate but immediately accessible room with a clear floor area of 150 square feet (13.94 square meters). Six single or three duplex electrical outlets shall be provided for the infant in addition to the facilities required for the mother.

d. Labor room(s) (LDR or LDRP rooms may be substituted)~~.~~ ~~I~~in renovation projects ~~, existing labor rooms may~~ shall have a minimum clear area of 100 square feet (9.3 square meters) per bed.

Where LDRs or LDRPs are not provided, a minimum of two labor beds shall be provided for each cesarean/delivery room. In facilities that have only one cesarean/delivery room, two labor rooms shall be provided. Each room shall be designed for either one or two beds, with a minimum clear area of 120 square feet (11.15 square meters) per bed. Each labor room shall contain a handwashing station and have access to a toilet room. One toilet room may serve two labor rooms. Labor rooms shall have controlled access with doors that are arranged for observation from a nursing station. At least one shower (which may be separate from the labor room if under staff control) for use of patients in labor shall be provided. Windows in labor rooms, if provided, shall be located, draped, or otherwise arranged~~,~~ to preserve patient privacy from casual observation from outside the labor room.

e. Recovery room(s) (LDR or LDRP rooms, when located within or adjacent to the cesarean/delivery suite, may be substituted~~.~~) ~~Each recovery room~~ shall contain at least two beds and have a nurse station with charting facilities located to permit visual control of all beds. Each room shall include a handwashing station and facilities for ~~handwashing and~~ dispensing medicine. A clinical sink with bedpan flushing device shall be available, as shall storage for supplies and equipment. When required by the functional program, ~~T~~there ~~should~~ shall be enough space for baby and crib and a chair for the support person. There ~~should~~ shall be the ability to maintain visual privacy of the new family.

f. Service areas

(1) Individual rooms shall be provided as indicated in the following standards; otherwise, alcoves or other open spaces that do not interfere with traffic may be used.

(2) The following ~~services~~ shall be provided:

(a) A control/nurse station located to restrict unauthorized traffic into the suite.

(b) Soiled workroom or soiled holding room. This room shall be separate from the clean workroom. The soiled workroom shall contain a clinical sink (or equivalent flushing-rim fixture)~~. The room shall contain~~ and a handwashing station. The above fixtures shall both have a hot and cold mixing faucet. The room shall have a work counter and space for separate covered containers for soiled linen and waste. Rooms used only for temporary holding of soiled material may omit the clinical sink and work counter. If the flushing-rim clinical sink is eliminated, facilities for cleaning bedpans shall be provided elsewhere.

(c) Fluid waste disposal.

(3) The following services may be shared with the surgical facilities ~~if~~ in accordance with the functional program ~~reflects this concern~~. Where shared, areas shall be arranged to avoid direct traffic between the delivery and operating rooms

(a) A supervisor's office or station.

(b) A waiting room, with toilets, telephones, and drinking fountains conveniently located. The toilet room shall contain handwashing stations.

*(c) Sterilizing facilities with high-speed sterilizers convenient to all cesarean/delivery rooms. Sterilization facilities ~~should~~ shall be separate from the delivery area and adjacent to clean assembly. ~~High-speed autoclaves should only be used in an emergency situation (i.e., a dropped instrument and no sterile replacement readily available). Sterilization facilities would not be necessary if the flow of materials were handled properly from a central service department based on the usage of the delivery room (DR).~~

(d) A drug distribution station with handwashing stations and provisions for controlled storage, preparation, and distribution of medication. A self-contained medication dispensing unit in accordance with Section 7.2.B13.b may be utilized instead.

(e) Scrub facilities for cesarean/delivery rooms. Two scrub positions shall be provided adjacent to entrance to each cesarean/delivery room. Scrub facilities ~~should~~ shall be arranged to minimize any splatter on nearby personnel or supply carts. In new construction, ~~provide~~ view windows shall be provided at scrub stations to permit the observation of room interiors.

(f) Clean workroom or clean supply room. A clean workroom shall be provided if clean materials are assembled within the obstetrical suite prior to use. ~~If a clean workroom is provided i~~It shall contain a work counter, ~~sink equipped for~~ handwashing station, and space for storage of supplies. A clean supply room may be provided when the functional program defines a system for the storage and distribution of clean and sterile supplies. See (h) below for sterile storage.

(g) Medical gas storage facilities. See Section 7.~~7~~8.C8.

(h) A clean sterile storage area readily available to the DR~~:~~. The size ~~to~~shall be ~~determined~~based on level of usage, functions provided, and supplies from the hospital central distribution area.

(i) An anesthesia workroom for cleaning, testing, and storing anesthesia equipment. It shall contain a work counter, sink, and provisions for separation of clean and soiled items.

(j) Equipment storage room(s) for equipment and supplies used in the obstetrical suite.

(k) Staff clothing change areas. The clothing change area shall be designed to encourage one-way traffic and eliminate cross-traffic between clean and contaminated personnel. The area shall contain lockers, showers, toilets, handwashing stations, and space for donning and disposing scrub suits and booties.

(l) Change areas for ~~M~~male and female support persons ~~change area~~ (designed as described above.)

(m) Lounge and toilet facilities for obstetrical staff convenient to delivery, labor, and recovery areas. The toilet room shall contain handwashing stations.

(n) An on-call room(s) for physician and/or staff. It may be located elsewhere in the facility.

(o) Housekeeping room with a floor receptacle or service sink and storage space for housekeeping supplies and equipment.

(p) An area for storing stretchers out of the path of normal traffic.

***7.~~8~~10.A4.** LDR and LDRP facilities. When provided by the functional program, delivery procedures in accordance with birthing concepts may be performed in the LDR (labor, delivery, recovery) or LDRP (labor, delivery, recovery, postpartum) rooms.

a. Location. LDR room(s) may be located in a separate LDR suite or as part of the cesarean/delivery suite. The postpartum unit may contain LDRP rooms.

b. Size.

(1) In new construction, ~~T~~these rooms shall have a minimum clear floor area of ~~250~~ 300 square feet (~~23.23~~ 27.87 square meters) ~~of clear floor area~~ with a minimum dimension of 13 feet (3.96 meters), exclusive of toilet room, closet, alcove, or vestibules. Where required by the functional program, ~~T~~there ~~should~~ shall be enough space for a crib and reclining chair for a support person. An area within the room but distinct from the mother's area shall be provided for infant stabilization and resuscitation. Each LDR or LDRP room shall be for single occupancy and have direct access to a private toilet with shower or tub.

(2) When renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above square-foot standards, existing LDR or LDRP rooms shall be permitted to have a minimum clear area of 200 square feet (18.58 square meters).

c. Medical gas outlets. See Table 7.5 for medical gas outlets. These outlets ~~should~~ shall be located in the room so that they are accessible to the mother's delivery area and infant resuscitation area. ~~When renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above square-foot standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, existing LDR or LDRP rooms may have a minimum clear area of 200 square feet (18.58 square meters).~~

~~Each LDR or LDRP room shall be for single occupancy and have direct access to a private toilet with shower or tub.~~
d. Handwashing stations. Each room shall be equipped with handwashing stations (handwashing stations with hands-free operation are acceptable for scrubbing).

e. Lighting. Portable ~~E~~examination lights ~~may~~ shall be ~~portable~~ permitted, but must be immediately accessible.

f. Finishes. Finishes shall be selected to facilitate cleaning and ~~with~~ to resist ~~ance to~~ strong detergents.

g. Privacy. Windows or doors within a normal sightline that would permit observation into the room shall be arranged or draped as necessary for patient privacy.

7.~~9~~11 Emergency Service

(See Section 9.6 for the separate outpatient emergency unit.)

***7.~~9~~11.A. Definition**

Levels of emergency care range from initial emergency management to definitive emergency care. For classification of emergency departments/services/trauma centers, see appendix.

7.~~9~~11.A1. Initial emergency management is care provided to stabilize a victim's condition and to minimize potential for further injury during transport to an appropriate service. Patients may be brought to the "nearest hospital," which may or may not have all required services for definitive emergency management. In those cases, ~~I~~it is important that the hospital~~, in those cases,~~ be able to assess and stabilize emergent illnesses and injuries and arrange for appropriate transfer.

7.~~9.~~11.A2. Emergency care may range from the suturing of lacerations to full-scale emergency medical procedures. Facilities that include personnel and equipment for definitive emergency care should provide for 24-hour service and complete emergency care leading to discharge to the patient's home or direct admission to the appropriate hospital.

7.~~9.~~11.B. General

The extent and type of emergency service to be provided will depend upon community needs and the availability of other services within the area. While initial emergency management must be available at every hospital, full-scale definitive emergency services may be impractical and/or an unnecessary duplication. All services need adequate equipment and 24-hour staffing to ensure no delay in essential treatment. The following standards are intended only as minimums. Additional facilities, as needed, shall be as required to satisfy the functional program.

Provisions for facilities to provide nonemergency treatment of outpatients are covered ~~separately~~ in Section 9.3.

7.~~9.~~11.C. Initial Emergency Management

At a minimum, each hospital shall have provisions for emergency treatment for staff, employees, and visitors, as well as for persons who may be unaware of or unable to immediately reach services in other facilities. This is not only for patients with minor illnesses or injuries that may require minimal care but also for persons with severe illness and injuries who must receive immediate emergency care and assistance prior to transport to other facilities.

Provisions for initial emergency management shall include the following:

7.~~9.~~11.C1. A well-marked, illuminated, and covered entrance, at grade level. The emergency vehicle entry cover shall provide shelter for both the patient and the emergency medical crew during transfer from an emergency vehicle into the building.

7.11.C2. Reception, triage, and control station shall be located to permit staff observation and control of access to treatment area, pedestrian and ambulance entrances, and public waiting area.

7.~~9.~~11.C~~2~~3. A treatment room with not less than 120 square feet (11.15 square meters) of clear area, exclusive of toilets, waiting area, and storage. Each treatment room shall contain an examination light, work counter, handwashing stations, medical equipment, cabinets, medication storage, adequate electrical outlets above floor level, and counter space for writing. The treatment room may have additional space and provisions for several patients with cubicle curtains for privacy. Multiple-bed treatment rooms shall provide a minimum of 80 square feet (7.43 square meters) per patient cubicle.

7.~~9.~~11.C~~3~~4. Storage out of traffic and under staff control for general medical/surgical emergency supplies, medications, and equipment such as ventilator, defibrillator, splints, etc.

7.~~9.~~11.C~~4~~5. Provisions for reception, control, and public waiting, including a public toilet with handwashing station(s), and telephone.

7.~~9.~~11.C~~5~~6. A patient toilet room with handwashing station(s) convenient to the treatment room(s).

7.~~9.~~11.C~~6~~7. Communication hookup to the Poison Control Center and regional emergency medical service (EMS) system.

7.~~9.~~11.C~~7~~8. Airborne infection control. At least one airborne infection isolation room shall be provided as described in Table 7.2 and ~~paragraphs~~ Sections 7.2.C3, 7.2.C4, 7.2.C6, and 7.2.C7. The isolation toilet room is not required to have a shower or bathtub. The need for additional airborne infection isolation rooms or for protective environment rooms as described in Section 7.2.D shall be determined by ~~the Infection Control Risk Assessment~~an ICRA.

***7.~~9.~~11.D. Definitive Emergency Care**
~~When~~ Where 24-hour emergency service is to be provided, the type, size, and number of the services shall be as defined in the functional program. As a minimum, the following shall be provided:

7.~~9.~~11.D1. ~~Grade level~~A well-marked, illuminated, and covered entrance at grade level, with direct access from public roads for ambulance and vehicle traffic. Entrance and driveway shall be clearly marked. If a raised platform is used for ambulance discharge, ~~provide~~ a ramp shall be provided for pedestrian and wheelchair access.

7.~~9.~~11.D2. Paved emergency access to permit discharge of patients from automobiles and ambulances, and temporary parking convenient to the entrance.

***7.~~9.~~11.D3.** Reception, triage (see Table 7.5), and control station, ~~shall be~~ located to permit staff observation and control of access to treatment area, pedestrian and ambulance entrances, and public waiting area.

The triage area requires special consideration. As the point of entry and assessment for patients with undiagnosed and untreated airborne infections, the triage area shall be designed and ventilated to reduce exposure of staff, patients, and families to airborne infectious diseases. (See Table 7.2.)

7.~~9.~~11.D4. Wheelchair and stretcher storage ~~shall be provided~~ for arriving patients. ~~This~~ It shall be out of traffic with convenient access from emergency entrances.

7.~~9.~~11.D5. Public waiting area with toilet facilities, drinking fountains, and telephones~~ shall be provided~~. If so determined by the hospital ~~Infection Control Risk Assessment~~ICRA, the emergency department waiting area shall require special measures to reduce the risk of airborne infection transmission. These measures may include enhanced general ventilation and air disinfection similar to inpatient requirements for airborne infection isolation rooms. See the CDC "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health Care Facilities."

7.~~9.~~11.D6. Communication center. It shall be convenient to the nursing station and have radio, telephone, and intercommunication systems. (See Section 7.~~29~~32.F.)

7.~~9.~~11.D7. Examination and treatment room(s).

a. Each ~~E~~examination room~~s~~ shall have a minimum clear floor area of 120 square feet (11.15 square meters)~~ of clear area~~, exclusive of fixed casework. The room shall contain work counter(s); cabinets;

handwashing stations; supply storage facilities; examination lights; a desk, counter, or shelf space for writing; and a vision panel adjacent to and/or in the door.

b. Where renovation work is undertaken, every effort shall be made to meet these minimum standards. If it is not possible to meet the standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, each room shall have a minimum clear area of 100 square feet (9.29 square meters), exclusive of fixed or wall-mounted cabinets and built-in shelves.

c. ~~When~~ Where treatment cubicles are in open multiple-bed areas, each cubicle shall have a minimum of 80 square feet (7.43 square meters) of clear floor space and shall be separated from adjoining cubicles by curtains. Handwashing stations shall be provided for each four treatment cubicles or major fraction thereof in multiple-bed areas.

d. For oxygen and vacuum, see Table 7.5.

e. Treatment/examination rooms used for pelvic exams ~~should~~ shall allow for the foot of the examination table to face away from the door.

***7.~~9.~~11.D8.** Trauma/cardiac rooms for emergency procedures, including emergency surgery~~,~~. Each room shall have at least 250 square feet (23.23 square meters) of clear floor space. ~~Each~~ The room shall ~~have~~ contain cabinets and emergency supply shelves, x-ray film illuminators, examination lights, and counter space for writing. Additional space with cubicle curtains for privacy may be provided to accommodate more than one patient at a time in the trauma room. Provisions shall be made for monitoring the patients. ~~There shall be s~~Storage shall be provided for immediate access to attire used for universal precautions. Doorways leading from the ambulance entrance to the cardiac trauma room shall be a minimum of 5 feet (1.52 meters) wide to simultaneously accommodate stretchers, equipment, and personnel. In renovation projects, every effort shall be made to have existing cardiac/trauma rooms meet the above minimum standards. If it is not possible to meet the above square-foot standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, these rooms shall be no less than a clear area of 240 square feet (21 square meters), and doorways leading from the ambulance entrance to the room may be 4 feet (1.22 meters) wide.

7.~~9.~~11.D9. Provisions for orthopedic and cast work. These may be in separate room(s) or in the trauma room. They shall include storage for splints and other orthopedic supplies, traction hooks, x-ray film illuminators, and examination lights. If a sink is used for the disposal of plaster of Paris, a plaster trap shall be provided. The clear floor space for this area shall be dependent on the functional program and the procedures and equipment accommodated here.

7.~~9.~~11.D10. Scrub stations located in or adjacent and convenient to each trauma and/or orthopedic room.

7.~~9.~~11.D11. Convenient access to radiology and laboratory services.

7.~~9.~~11.D12. Poison Control Center and EMS Communications Center. If provided, they shall be permitted to be ~~may be a~~ part of the staff work and charting area.

7.~~9.~~11.D13. Provisions for disposal of solid and liquid waste. This may be a clinical sink with bedpan flushing device within the soiled workroom.

7.~~9.~~11.D14. Emergency equipment storage. Sufficient space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a CPR cart, pumps, ventilators, patient monitoring equipment, and portable x-ray unit. This space shall be located in an area appropriate to the functional

program easily accessible to staff but out of normal traffic patterns.

7.~~9.~~11.D15. A toilet room for patients. A minimum of one patient toilet rooms per eight treatment rooms or fraction thereof shall be provided, ~~Where there are more than eight treatment areas, a minimum of two toilet facilities,~~ with handwashing station(s) in each toilet room~~, will be required~~.

7.~~9.~~11.D16. Storage rooms for clean, soiled, or used supplies.

*a. Soiled workroom or soiled holding room for the exclusive use of the emergency service. This room shall be separate from the clean workroom. The soiled workroom shall contain a clinical sink (or equivalent flushing-rim fixture)~~. The room shall contain~~ and a ~~lavatory (or~~ handwashing station~~)~~. The above fixtures shall both have a hot and cold mixing faucet. The room shall have a work counter and space for separate covered containers for soiled linen and waste. Rooms used only for temporary holding of soiled material may omit the clinical sink and work counter. If the flushing-rim clinical sink is eliminated, facilities for cleaning bedpans shall be provided elsewhere.

b. Clean workroom or clean supply room. If the room is used for preparing patient care items, it shall contain a work counter, a handwashing station, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile supply materials, the work counter and handwashing stations may be omitted. If the area serves children, additional storage shall be provided to accommodate supplies and equipment in the range of sizes required for pediatrics. Soiled and clean workrooms or holding rooms shall be separated and have no direct connection.

7.~~9.~~11.D17. Administrative center or nurses station for staff work and charting. These areas shall have space for counters, cabinets, and medication storage, and shall have convenient access to handwashing stations. They ~~may~~ are permitted to be combined with or include centers for reception and communication or poison control. ~~These n~~Nursing stations ~~may also be~~ decentralized near clusters of treatment rooms are permitted. Where feasible, ~~V~~visual observation of all traffic into the unit and of all patients ~~should~~ shall be provided from the nursing station~~, where feasible~~.

7.~~9.~~11.D18. Securable closets or cabinet compartments for the personal effects of emergency service personnel, located in or near the nurse station. At a minimum, these shall be large enough for purses and billfolds. Coats may be stored in closets or cabinets in the unit or in a central staff locker area.

7.~~9.~~11.D19. Staff lounge. Convenient and private access to staff toilets, lounge, and lockers shall be provided.

7.~~9.~~11.D20. Housekeeping room. A housekeeping room shall be directly accessible from the unit and shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

***7.~~9.~~11.D21.** Security station. Where dictated by local needs, ~~A~~a security system ~~should~~ shall be located near the emergency entrances and triage/reception area. ~~The non-selective 24-hour accessibility of the emergency department dictates that a security system reflecting local community needs be provided.~~

7.~~9.~~11.D22. Airborne infection isolation room. At least one airborne infection isolation room shall be provided as described in Table 7.2 and paragraphs 7.2.C3, 7.2.C4, 7.2.C6, and 7.2.C7. The need for additional airborne infection isolation rooms or for protective environment rooms as described in Section 7.2.D shall be determined by ~~the Infection Control Risk Assessment~~an ICRA.

***7.~~9.~~11.D23.** Bereavement room.

***7.~~9.~~11.D24.** Secured holding room. At least one holding/seclusion room of 120 square feet (11.15 square meters) shall be provided. This room shall allow for security, patient and staff safety, patient observation, and soundproofing.

***7.~~9.~~11.D~~.~~25.** Decontamination area. ~~A decontamination area shall be provided. The functional program shall define the location of the area and the types of exposure (i.e., nuclear, biological, chemical) to be considered. The location of the area shall be permitted to be on the exterior perimeter of the facility adjacent to the ambulance entrance or built within the walls of the facility.~~ In new construction, a decontamination room shall be provided with an outside entry point as far as practical from the closest other entrance. The internal door shall open into a corridor of the emergency department, swing into the room, and be lockable against ingress from the corridor. The room shall provide a minimum 80 sqare feet (80 sqare meters) clear floor area. The room shall have all smooth, nonporous, scrubbable, nonadsorptive, nonperforated surfaces. Fixtures shall be acid resistant. The floor of the decontamination room shall be self-coving to a height of 6 inches (15.24 centimeters). The room shall be equipped with two hand-held shower heads with temperature controls and dedicated holding tank with floor drain. Portable or hard-piped oxygen shall be provided. Portable suction shall also be available. This paragraph does not preclude decontamination capability at other locations or entrances immediately adjacent to the emergency department.

See Table 7.2 for ventilation requirements.

***7.11.D26.** Pediatric care.

***7.~~9.~~11.E. Other Space Considerations**

7.11.E1. Observation ~~U~~units. Handwashing stations shall be provided for each four treatment cubicles or major fraction thereof. Handwashing stations shall be convenient to nurse stations and patient bed areas.

Each patient bed area shall have space at each bedside for visitors, and provision for visual privacy from casual observation by other patients and visitors.

One toilet room shall be provided for each eight treatment cubicles or major fraction thereof.

One shower room shall be provided for each eight treatment cubicles or major fraction thereof; the shower room and toilet room may be combined into the same room.

A nourishment station that may be shared shall be provided, to include a sink, work counter, refrigerator, storage cabinets, and equipment for hot and cold nourishment between scheduled meals.

7.~~10~~ 12 Imaging Suite

7.~~10.~~12.A. General

***7.~~10.~~12.A1.** Equipment and space shall be as necessary to accommodate the functional program. The imaging department provides diagnostic procedures. ~~It~~ An imaging department commonly includes fluoroscopy, radiography, mammography, tomography, computerized tomography scanning, ultrasound, magnetic resonance, angiography, and ~~other~~ similar techniques.

7.~~10.~~12.A2. Most imaging requires radiation protection. A certified physicist or other qualified expert

representing the owner or appropriate state agency shall specify the type, location, and amount of radiation protection to be installed in accordance with the final approved department layout and equipment selections. Where protected alcoves with view windows are required, a minimum of 1'-6" (0.45 meter) shall be provided between the view window and the outside partition edge~~ shall be provided~~. Radiation protection requirements shall be incorporated into the specifications and the building plans.

***7.~~10.~~12.A3.** Beds and stretchers shall have ready access to and from other departments of the institution.

7.~~10.~~12.A4. Floor~~ing~~ shall be adequate to meet load requirements. ~~for equipment, patients, and personnel. Provision for wiring raceways, ducts or conduits shall be made in floors, walls, and ceilings. Ceiling heights shall be permitted to be higher than normal. Ceiling mounted equipment shall have properly designed rigid support structures located above the finished ceiling.~~ A lay-in type ceiling shall be permitted to be considered for ease of installation, service, and remodeling.

7.~~10.~~12.B. Angiography

***7.~~10.~~12.B1.** Space shall be provided as necessary to accommodate the functional program.

7.~~10.~~12.B2. A control room shall be provided as necessary to ~~meet the needs of~~ accommodate the functional program. A view window shall be provided to permit full view of the patient.

***7.~~10.~~12.B3.** A viewing area shall be provided.

7.~~10.~~12.B4. A scrub sink located outside the staff entry to the procedure room shall be provided for use by staff.

***7.~~10.~~12.B5.** Patient holding area.

7.~~10.~~12.B6. Storage for portable equipment and catheters shall be provided.

7.~~10.~~12.B7. Provision shall be made within the facility for extended post-procedure observation of outpatients.

7.~~10.~~12.C. Computerized Tomography (CT) Scanning

7.~~10.~~12.C1. CT scan rooms shall be as required to accommodate the equipment.

7.~~10.~~12.C2. A control room shall be provided that is designed to accommodate the computer and other controls for the equipment. A view window shall be provided to permit full view of the patient. The angle between the control and equipment centroid shall permit the control operator to see the patient's head.

7.~~10.~~12.C3. The control room shall be located to allow convenient film processing.

7.~~10.~~12.C4. A patient toilet shall be provided. It shall be convenient to the procedure room and, if directly accessible to the scan room, arranged so that a patient can leave the toilet without having to reenter the scan room.

7.~~10.~~12.D. Diagnostic X-Ray

***7.~~10.~~12.D1.** Radiography rooms. These rooms shall be of a size to accommodate the functional program.

***7.~~10.~~12.D2.** Tomography, radiography/fluoroscopy rooms. Separate toilets with handwashing stations shall be provided with direct access from each radiographic/fluoroscopic (R&F) room so that a patient can leave the toilet without having to reenter the R&F room. Rooms used only occasionally for fluoroscopic procedures shall be permitted to use nearby patient toilets if they are located for immediate access.

***7.~~10.~~12.D3.** Mammography.

7.~~10.~~12.D4. X-ray. Each x-ray room shall include a shielded control alcove. This area shall be provided with a view window designed to provide full view of the examination table and the patient at all times, including full view of the patient when the table is in the tilt position or the chest x-ray is ~~being utilized~~in use. For mammography machines with built-in shielding for the operator, the alcove shall be permitted to be omitted when approved by the certified physicist or state radiation protection agency.

7.~~10.~~12.E. Magnetic Resonance Imaging (MRI)

7.~~10.~~12.E1. Space shall be provided as necessary to accommodate the functional program. The MRI room shall be permitted to range from 325 square feet (30.19 square meters) to 620 square feet (57.6 square meters), depending on the vendor and magnet strength.

***7.~~10.~~12.E2.** A control room shall be provided with full view of the MRI.

***7.~~10.~~12.E3.** A computer room shall be provided.

***7.~~10.~~12.E4.** Cryogen storage.

***7.~~10.~~12.E5.** Darkroom.

7.~~10.~~12.E6. When spectroscopy is provided, caution shall be exercised in locating it in relation to the magnetic fringe fields.

***7.~~10.~~12.E7.** Power conditioning.

***7.~~10.~~12.E8.** Magnetic shielding.

***7.~~10.~~12.E9.** Patient hold area.

7.~~10.~~12.E10. Cryogen venting shall be provided~~is required~~.

7.~~10.~~12.F. Ultrasound

7.~~10.~~12.F1. Space shall be provided as necessary to accommodate the functional program.

7.~~10.~~12.F2. A patient toilet, accessible from the procedure room, shall be provided.

7.~~10.~~12.G. Support Spaces
The following spaces are common to the imaging department and are minimum requirements unless stated otherwise:

7.~~10.~~12.G1. Patient waiting area. The area shall be out of traffic, under staff control, and shall have seating capacity in accordance with the functional program. If the suite is routinely used for outpatients and inpatients at the same time, separate waiting areas shall be provided with screening for visual privacy between the waiting areas.

If so determined by ~~the hospital Infection Control Risk Assessment~~an ICRA, the diagnostic imaging waiting area shall require special measures to reduce the risk of airborne infection transmission. These measures shall include enhanced general ventilation and air disinfection techniques similar to inpatient requirements for airborne infection isolation rooms (see Table 7.2). See the "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities."

7.~~10.~~12.G2. Control desk and reception area.

7.~~10.~~12.G3. Holding area. A convenient holding area under staff control shall be provided to accommodate inpatients on stretchers or beds.

7.~~10.~~12.G4. Patient toilet rooms. Toilet rooms with handwashing stations ~~shall be provided~~ convenient to the waiting rooms and ~~shall be~~ equipped with an emergency call system shall be provided. ~~Separate toilets with handwashing stations shall be provided with direct access from each radiographic/fluoroscopic room so that a patient can leave the toilet without having to reenter the R&F room. Rooms used only occasionally for fluoroscopic procedures shall be permitted to utilize nearby patient toilets if they are located for immediate access.~~

7.~~10.~~12.G5. Patient dressing rooms. Dressing rooms shall be provided convenient to the waiting areas and x-ray rooms. Each room shall include a seat or bench, mirror, and provisions for hanging patients' clothing and ~~for~~ securing valuables.

7.~~10.~~12.G6. Staff facilities. Toilets and staff lounge with lockers shall be permitted to be outside the suite but shall be convenient for staff use. In ~~larger~~ suites of three or more procedure rooms, toilets internal to the suite shall be provided.

7.~~10.~~12.G7. Film storage (active). A room with cabinet or shelves for filing patient film for immediate retrieval shall be provided.

7.~~10.~~12.G8. Film storage (inactive). A room or area for inactive film storage shall be provided. It shall be permitted to be outside the imaging suite, but must be under imaging's administrative control and properly secured to protect films against loss or damage.

7.~~10.~~12.G9. Storage for unexposed film. If film systems are used, ~~S~~storage facilities for unexposed film shall include protection of film against exposure or damage and shall not be warmer than the air of adjacent occupied spaces.

7.~~10.~~12.G10. Offices for radiologist(s) and assistant(s). Offices shall include provisions for viewing, individual consultation, and charting of film.

7.~~10.~~12.G11. Clerical offices/spaces. Office space shall be provided as necessary for the functional program.

7.~~10.~~12.G12. Consultation area. An appropriate area for individual consultation with referring clinicians shall be provided.

7.~~10.~~12.G13. Contrast media preparation. If contrast media are used, ~~T~~this area shall be ~~provided with~~include a sink, counter, and storage to allow for mixing of contrast media. One preparation room, if conveniently located, shall be permitted to serve any number of rooms. Where pre-prepared media ~~is~~are used, this area shall be permitted to be omitted, but storage shall be provided for the media.

7.~~10.~~12.G14. Film processing room. If film systems are used, ~~A~~a darkroom shall be provided for processing film unless the processing equipment normally used does not require a darkroom for loading and transfer. When daylight processing is used, the darkroom shall be permitted to be minimal for emergency and special uses. Film processing shall be located convenient to the procedure rooms and to the quality control area.

7.~~10.~~12.G15. Quality control area. An area or room shall be provided near the processor for viewing film immediately after it is processed. All view boxes shall be illuminated to provide light of the same color value and intensity for appropriate comparison of several adjacent films.

7.~~10.~~12.G16. Cleanup facilities. Provisions for cleanup shall be located within the suite for convenient access and use. ~~It~~ The facilities shall include service sink or floor receptacle as well as storage space for equipment and supplies. If automatic film processors are used, a receptacle of adequate size with hot and cold water for cleaning the processor racks shall be provided.

7.~~10.~~12.G17. Handwashing stations. Handwashing stations shall be provided within each procedure room unless the room is used only for routine screening such as chest x-rays where the patient is not physically handled by the staff. Handwashing stations shall be provided convenient to the MRI room, but need not be within the room.

7.~~10.~~12.G18. Clean storage. Provision~~s~~ shall be made for the storage of clean supplies and linens. If conveniently located, storage shall be permitted to be shared with another department.

7.~~10.~~12.G19. Soiled holding. Provision~~s~~ shall be made for soiled holding. Separate provisions for contaminated handling and holding shall be made. Handwashing stations shall be provided.

7.~~10.~~12.G20. Provision shall be made for locked storage of medications and drugs.

~~**7.10.G21.** Details and finishes; mechanical; electrical. See Section 7.28 for details and finishes; 7.31 for mechanical; and 7.32 for electrical.~~

7.~~10.~~12.H. Cardiac Catheterization Lab (Cardiology)

Note: The number of procedure rooms and the size of the prep, holding, and recovery areas shall be based on expected utilization. If electrophysiology~~EP~~ labs are also provided in accordance with the approved functional program, these labs may be located within and integral to the catheterization suite, or located in a separate functional area proximate to the cardiac care unit.

7.~~10.~~12.H1. The cardiac catheterization lab is normally a separate suite, but shall be permitted to be within the imaging suite provided that the appropriate sterile environment is provided. It can be combined with angiography in low usage situations.

7.~~10.~~12.H2. The procedure room shall be a minimum of 400 square feet (37.16 square meters) exclusive of fixed cabinets and shelves.

7.~~10.~~12.H3. A control room or area shall be provided and shall be large enough to contain and provide for the efficient functioning of the x-ray and image recording equipment. A view window permitting full

view of the patient from the control console shall be provided.

7.~~10.~~12.H4. An equipment room or enclosure large enough to contain x-ray transformers, power modules, and associated electronics and electrical gear shall be provided.

7.~~10.~~12.H5. Scrub facilities with hands-free operable controls shall be provided adjacent to the entrance of procedure rooms, and shall be arranged to minimize incidental splatter on nearby personnel, medical equipment, or supplies.

7.~~10.~~12.H6. Staff change area(s) shall be provided and arranged to ensure a traffic pattern so that personnel can enter ~~entering~~ from outside the suite ~~can enter~~, change their clothing, and move directly into the cardiac catheterization suite.

7.~~10.~~12.H7. A patient preparation, holding, and recovery area or room shall be provided and arranged to provide visual observation before and after the procedure.

7.~~10.~~12.H8. A clean workroom or clean supply room shall be provided. If the room is used for preparing patient care items, it shall contain a work counter and handwashing station. If the room is used only for storage and holding of clean and sterile supply materials, the work counter and handwashing stations shall be permitted to be omitted.

7.~~10.~~12.H9. A soiled workroom shall be provided. It ~~which~~ shall contain a handwashing station and a clinical sink (or equivalent flushing-rim fixtures). ~~When~~ If the room is used for temporary holding ~~or~~ of soiled materials, the clinical sink shall be permitted to be omitted.

7.~~10.~~12.H10. A ~~H~~housekeeping closet containing a floor receptor or service sink and provisions for storage of supplies and housekeeping equipment shall be provided.

7.~~10.~~12.H11. The following shall be available for use by the cardiac catheterization suite:

a. A viewing room.

b. A film file room.

7.13 Freestanding Emergency Service

7.13.A. Freestanding emergency service shall mean an extension of an existing hospital emergency department that is physically separate from the main hospital emergency department and that is intended to provide comprehensive emergency service. A service that does not provide 24-hours-a-day, seven-days-a-week operation or that is not capable of providing basic services as defined for hospital emergency departments shall not be classified as a freestanding emergency service and shall be described under other portions of this document.

7.13.A1. Physically separate from the main hospital means not located on the same campus.

7.13.A2. Except as noted in the following sections, the requirements for freestanding emergency service shall be the same as for hospital emergency service as described in Section 7.11.

7.13.B. General. See Section 7.11.B.

7.13.C. Initial emergency management. See Section 7.11.C.

7.13.D. Definitive emergency care.

7.13.D1 through 25. See Sections 7.11.D1 through 25, respectively.

7.13.D26. The hospital shall prepare a written policy and implementing plan describing how and when patients will be transferred from the freestanding emergency service to the main hospital when admission is required. The plan shall cover patient care, medical records coordination, and transportation services including ambulance requirements for each type of patient to be transported.

7.13.D27. The freestanding emergency service shall have the following capabilities and/or functions within the facility:

a. Diagnostic imaging to include radiography and fluoroscopy.

b. Laboratory to include those functions described in Section 7.15.

c. Observation beds, at least one of which shall have full cardiac monitoring.

d. Provision for serving patient and staff meals. This may be a kitchen or a satellite serving facility.

e. Pharmacy.

f. Support services and functions, to include housekeeping, laundry, general stores, maintenance and plant operations, and security.

7.~~11~~ 14 Nuclear Medicine

***7.~~11.~~14.A.** Equipment and space shall be provided as necessary to accommodate the functional program. ~~Nuclear medicine may include positron emission tomography, which is not common to most facilities. It requires specialized planning for equipment.~~

7.~~11.~~14.B. A certified physicist or other qualified expert representing the owner or state agency shall specify the type, location, and amount of radiation protection to be installed in accordance with final approved department layout and equipment selection. These specifications shall be incorporated into the plans.

7.~~11.~~14.C. ~~Flooring should meet load requirements for equipment, patients, and personnel. Floors and walls should be constructed of materials that are easily decontaminated in case of radioactive spills. Walls should contain necessary support systems for either built-in or mobile oxygen and vacuum, and vents for radioactive gases. Provision for wiring raceways, ducts or conduits should be made in floors, walls, and ceilings. Ceilings may be higher than 8'-0" (2.44 meters). Ceiling mounted equipment should have properly designed rigid support structures located above the finished ceiling. A lay-in type ceiling should be considered for ease of service, installation, and remodeling.~~ Provision for wiring raceways, ducts, or conduits shall be made in floors, walls, and ceilings. Ceiling-mounted equipment shall have properly designed rigid support structures located above the finished ceiling.

7.~~11.~~14.D. Space shall be provided as necessary to accommodate the functional program. Where the functional program calls for it, the nuclear medicine room shall accommodate the equipment, a stretcher, exercise equipment (treadmill and/or bicycle), and staff.

7.~~11.~~14.E. If radiopharmaceutical preparation is performed on-site, an area adequate to house a radiopharmacy shall be provided with appropriate shielding. This area ~~should~~shall include adequate space for storage of radionuclides, chemicals for preparation, dose calibrators, and record keeping. Floors and walls should be constructed of easily decontaminated materials. Vents and traps for radioactive gases ~~should~~ shall be provided if such are used. Hoods for pharmaceutical preparation shall meet applicable standards. If pre-prepared materials are used, storage and calculation area may be considerably smaller than that for on-site preparation. Space shall provide adequately for dose calibration, quality assurance, and record keeping. The area may still require shielding from other portions of the facilities.

***7.~~11.~~14.F. Positron Emission Tomography (PET)**

7.~~11.~~14.G. The ~~N~~nuclear medicine area, when operated separately from the imaging department, shall include the following:

7.~~11.~~14.G1. Space shall be adequate to permit entry of stretchers~~,~~ and beds~~,~~ and able to accommodate imaging equipment, electronic consoles, and if present, computer terminals.

***7.~~11.~~14.G2.** If film processing is used, An ~~darkroom~~ on-site darkroom shall be ~~available~~ provided for film processing. ~~The darkroom should contain protective storage facilities for unexposed film that guard the film against exposure or damage.~~

7.~~11.~~14.G3. When the functional program requires a centralized computer area, it ~~should~~ shall be a separate room with access terminals available within the imaging rooms.

7.~~11.~~14.G4. Provisions for cleanup shall be located within the suite for convenient access and use. ~~It~~Cleanup facilities shall include service sink or floor receptacle as well as storage space for equipment and supplies.

~~**7.11.G5.** Film storage with cabinets or shelves for filing patient film for immediate retrieval shall be provided.~~

7.~~11.~~14.G~~6~~5. Inactive film storage under ~~the~~ departmental administrative control and properly secured to protect film against loss or damage shall be provided and can be off site.

7.~~11.~~14.G~~7~~6. A consultation area with view boxes illuminated to provide light of the same color value and intensity for appropriate comparison of several adjacent films shall be provided. Space ~~should~~ shall be provided for computer access and display terminals if such are included in the program.

7.~~11.~~14.G~~8~~7. Offices for physicians and assistants shall be provided and equipped for individual consultation, viewing, and charting of film.

7.~~11.~~14.G~~9~~8. Clerical offices and spaces shall be provided as necessary for the program to function.

7.~~11.~~14.G~~10~~9. Waiting areas shall be provided out of traffic, under staff control, and ~~shall have~~with seating capacity in accordance with the functional program. If the department is routinely used for outpatients and inpatients at the same time, separate waiting areas shall be provided with screening or visual privacy between the waiting areas.

***7.~~11.~~14.G~~11~~10.** A dose administration area as specified by the functional program~~,~~ shall be provided, ~~and~~ located near the preparation area. Since as much as several hours may elapse for the dose to take effect, the area shall provide for visual privacy from other areas. ~~Thought should be given to~~

~~entertainment and reading materials.~~

7.~~11.~~14.G~~12~~11. A holding area for patients on stretchers or beds shall be provided out of traffic and under control of staff. It ~~and~~ may be combined with the dose administration area provided there is ~~with~~ visual privacy between the areas.

7.~~11.~~14.G~~13~~12. Patient dressing rooms shall be provided convenient to the waiting area and procedure rooms. Each dressing room shall include a seat or bench, a mirror, and provisions for hanging patients' clothing and ~~for~~ securing valuables.

7.~~11.~~14.G~~14~~13. Toilet rooms reserved for nuclear medicine patients shall be provided convenient to waiting and procedure rooms.

7.~~11.~~14.G~~15~~14. Staff toilet(s) shall be provided convenient to the nuclear medicine laboratory.

7.~~11.~~14.G~~16~~15. Handwashing stations shall be provided within each procedure room.

7.~~11.~~14.G~~17~~16. A ~~C~~control desk and reception area shall be provided.

7.~~11.~~14.G~~18~~17. A ~~S~~storage area for clean linen with a handwashing station shall be provided.

7.~~11.~~14.G~~19~~18. A soiled workroom shall be provided. It shall contain a handwashing station and a clinical sink (or equivalent flushing-rim fixtures). If the room is used for temporary holding of soiled materials, the clinical sink shall be permitted to be omitted.~~Provisions with handwashing stations shall be made for holding soiled material. Separate provisions shall be made for holding contaminated material.~~

~~**7.11.G20.** See Section 7.28 for details and finishes; 7.31 for mechanical; and 7.32 for electrical.~~

7.~~11.~~14.H. Radiotherapy Suite

*__7.~~11.~~14.H1.__ Rooms and spaces shall be provided as necessary to accommodate the functional program. ~~Equipment manufacturers recommendations should be sought and followed, since space requirements may vary from one machine to another and one manufacturer to another. The radiotherapy suite may contain one or both electron beam therapy and radiation therapy. Although not recommended, a simulation room may be omitted in small linear accelerator facilities where other positioning geometry is provided.~~

7.~~11.~~14.H2. Cobalt, linear accelerators, and simulation rooms require radiation protection. A certified physicist representing the owner or appropriate state agency shall specify the type, location, and amount of protection to be installed in accordance with final approved department layout and equipment selection. The architect shall incorporate these specifications into the hospital building plans.

7.~~11.~~14.H3. Cobalt rooms and linear accelerators shall be sized in accordance with equipment requirements and shall accommodate a stretcher for litter-borne patients. Layouts shall provide for preventing the escape of radioactive particles. Openings into the room, including doors, ductwork, vents, and electrical raceways and conduits, shall be baffled to prevent direct exposure to other areas of the facility.

***7.~~11.~~14.H4.** Simulator, accelerator, and cobalt rooms shall be sized to accommodate the equipment with patient access on a stretcher, medical staff access to the equipment and patient, and service access.

7.~~11.~~14.H5. Flooring shall be adequate to meet load requirements for equipment, patients, and personnel. Provision for wiring raceways, ducts, or conduit ~~should~~ shall be made in floors and ceilings. Ceiling~~-~~mounted equipment ~~should~~ shall have properly designed rigid support structures located above the finished ceiling. ~~The ceiling height is normally higher than 8'-0" (2.44 meters). A lay-in type of ceiling should be considered for ease of installation, service, and remodeling.~~

7.~~11.~~14.I. General Support Areas
The following areas shall be provided and can be shared with other areas if required by the functional program~~unless they are accessible from other areas such as imaging or OPD~~:

7.~~11.~~14.I1. A stretcher hold area adjacent to the treatment rooms, screened for privacy, and combined with a seating area for outpatients. The size of the~~se~~ area~~s~~ will be dependent on the program for outpatients and inpatients.

7.~~11.~~14.I2. Exam rooms for each treatment room as specified by the functional program~~,~~. ~~e~~Each exam room ~~to~~shall be a minimum of 100 square feet (9.29 square meters). Each exam room shall be equipped with a handwashing station.

7.~~11.~~14.I3. Darkroom convenient to the treatment room(s) and the quality control area. Where daylight processing is used, the darkroom may be minimal for emergency use. If automatic film processors are used, a receptacle of adequate size with hot and cold water for cleaning the processor racks shall be provided either in the darkroom or nearby.

7.~~11.~~14.I4. Patient gowning area with provision for safe storage of valuables and clothing. At least one space should be large enough for staff-assisted dressing.

7.~~11.~~14.I5. Business office and/or reception/control area.

7.~~11.~~14.I6. Housekeeping room equipped with service sink or floor receptor and large enough for equipment or supplies storage.

7.~~11.~~14.I7. Film file area.

7.~~11.~~14.I8. Film storage area for unprocessed film.

7.~~11.~~14.J. Optional Support Areas
The following areas may be required by the functional program:

7.~~11.~~14.J1. Quality control area with view boxes illuminated to provide light of the same color value and intensity.

7.~~11.~~14.J2. Computer control area, normally located just outside the entry to the treatment room(s).

7.~~11.~~14.J3. Dosimetry equipment area.

7.~~11.~~14.J4. Hypothermia room (may be combined with an exam room).

7.~~11.~~14.J5. Consultation room.

7.~~11.~~14.J6. Oncologist's office (may be combined with consultation room).

7.~~11.~~14.J7. Physicist's office (may be combined with treatment planning).

7.~~11.~~14.J8. Treatment planning and record room.

7.~~11.~~14.J9. Work-station/nutrition station.

7.~~11.~~14.K. Additional Support Areas for Linear Accelerator

7.~~11.~~14.K1. Mold room with exhaust hood and handwashing station.

7.~~11.~~14.K2. Block room with storage. The block room may be combined with the mold room.

7.~~11.~~14.L. Additional Support Areas for Cobalt Room

7.~~11.~~14.L1. Hot lab.

A7.1.D.

A formal parking/traffic study should be conducted to ensure that adequate parking and traffic flow is provided to accommodate inpatients, outpatients, staff, and visitors.

A7.1.E.
Facility design for swing beds often requires additional corridor doors and provisions for switching nurse call operations from one nurse station to another depending on use.

~~**A7.2.A1.** Unless the functional program demonstrates the therapeutic and social value of a multi-bedded arrangement, the maximum number of beds per room should be one.~~

A7.2.A2. Patient rooms. In new construction, single patient rooms should be at least 12 feet (3.65 meters) wide by 13 feet (3.96 meters) deep (or approximately 160 square feet, or 14.86 square meters) exclusive of toilet rooms, closets, lockers, wardrobes, alcoves, or vestibules. These spaces should accommodate comfortable furniture for family members (one or two) without blocking access of staff members to patients. Efforts should be made to provide the patient with some control of the room environment.

A7.2A3. Where a facility contemplates patient/family-centered care rooms, the rooms shall be single-bed rooms, shall be constructed to meet the needs of the functional program, and shall have a minimum of 250 square feet (76.2 square meters) of clear floor area exclusive of family alcoves, toilet rooms, closets, lockers, wardrobes, vestibules, staff charting areas, or staff handwashing stations, and a minimum clear dimension of 15 feet (4.57 meters). Additional areas shall be provided at a minimum clear area of 30 square feet (9.14 square meters) per family member (permitted by the facility). Consideration for a homelike atmosphere, furniture arrangements, and orientation to the patient bed and room windows shall reflect the functional needs of the facility's program.

A7.2.A~~3~~4. Windows are important for the psychological well-being of many patients, as well as for meeting fire safety code requirements. They are also essential for continued use of the area in the event of mechanical ventilation system failure.

A7.2.A~~4~~5. Where renovation work is undertaken, every effort should be made to meet this standard. Where space does not permit the installation of an additional handwashing station in the patient room, or where it is technically infeasible, the authority having jurisdiction may grant approval of alternative forms of hand cleansing.

A7.2.B1. The station should permit visual observation of all traffic into the unit.

A7.2.B9. Multipurpose rooms are used primarily for staff purposes and generally are not available for family or visitors. A waiting room convenient to the unit should be provided.

A7.2.B18. A storage or bin space should be included for recyclable materials: white paper, mixed paper, cans, bottles, and cardboard.

A7.2.C. In general, the reliance on a substantial pressure differential (> 0.01"wg) will maintain the appropriate directional airflow with or without the anteroom. The anteroom concept should remain as an option (i.e., not required). Anterooms, in general, should be designed to meet local fire safety code as well as to prevent air from the patient room from escaping to the corridor or other common areas. In addition to the concept of containment of airborne microorganisms, anterooms may appropiately be used for

storage of personal protective equipment (PPE) (e.g., respirators, gowns, gloves), clean equipment, and hand hygiene. In ganged anterooms (two patient rooms with a common anteroom) it may be difficult to maintain directional airflow and pressure differential in order to avoid contamination from one room to the other through the anteroom. The design, installation, and monitoring of ventilation systems in such configurations is of utmost importance. Having a protective environment is not a minimum requirement. (See A7.2.D). Facilities with a PE should include at least one AII/PE room. Use of an anteroom in the immune-compromised patient condition for simultaneous airborne infection isolation and protective environment is critical to protect both the patient from the environment and the environment from the patient.

A7.2.D.
Immunosuppressed Host Airborne Infection Isolation (Protective Environment/Airborne Infection Isolation). An anteroom is required for the special case in which an immunosuppressed patient requires airborne infection isolation. Immunosuppression is defined in 7.2.D. There is no prescribed method for anteroom ventilation--the room can be ventilated with either of the following airflow patterns: (a) airflows from the anteroom, to the patient room and the corridor, or (b) airflows from the patient room and the corridor, into the anteroom. The advantage of pattern (a) is the provision for a clean anteroom in which health care workers need not mask before entering the anteroom.

A7.2.D.7. General space and staffing requirements are critical for bone marrow transplant facilities. Patients in these units may be acutely aware of the surrounding environment, which is their life support system during the many weeks when they will be confined in an immunosuppressed condition. Means of controlling unnecessary noise are important. At times, each patient may require individual privacy, although each is required to be under close staff supervision.

Bone marrow transplant rooms should be located ~~so as~~ to have access within the hospital to out-of-unit diagnostic and treatment equipment, particularly radiation therapy equipment. All bone marrow transplant-designated beds should be in exceptionally clean environments, which should consist of protective environment rooms equipped with HEPA filtration, preferably located ~~in~~ close ~~proximity~~ to each other. A countertop with scrub sink and space for high-level disinfection procedures should be available outside the entrance to each patient room when located within the nursing unit or at each entrance to a dedicated bone marrow transplant room. A handwashing station should be accessible near the entrance to each patient room within a dedicated bone marrow transplant unit.

Each bone marrow transplant patient room should have a private toilet room, which contains a water closet and a bathing facility, for the exclusive use of the patient. The patient should be able to enter the room directly without leaving the patient room or passing through the vestibule. The patient should also have a lavatory for the patient's exclusive use, located in the patient room or the private toilet room.

Patients should be housed in single-bedded rooms with full-height partitions, sealed airtight to the structure to prevent cross-infections. All surfaces, floors, walls, ceilings, doors, windows, and curtains should be scrubbable.

Windows should be provided so that each patient may be cognizant of the outdoor environment. Windowsill height should not exceed 3 feet (0.91 meter) above the floor and should be above grade. All windows in the unit should be fixed sash and sealed to eliminate infiltration.

Viewing panels should be provided in doors or walls for nursing staff observation. Flame-retardant curtains or other means should be provided to cover windows and viewing panels when a patient requires

visual privacy. Glazing should be safety glass, wire glass, or tempered clear plastic to reduce hazards from accidental breakage.

Each patient room should be provided with a nurses calling system accessible at the bed, sitting area, and patient toilet room. An emergency call system should also be provided at each patient bed and toilet room to summon additional personnel from on-call rooms, consultation rooms, and staff lounges. Facilities for administration of suction, compressed air, and oxygen should be provided at the bed.

Each geographically distinct unit should provide appropriate space to support nurses' administrative activities, report/conference room activities, doctors' consultation, drug preparation and distribution, emergency equipment storage, and closed accessible waiting for family members.

A7.2.F. The purpose of this section is to lend guidance in the design of units that by their very nature require a protected environment for the treatment and care of their patients. The following units fall within this intended guidance, although this list is not inclusive: transplant units, burn units, nurseries, units for immunosuppressed populations, and neonatal intensive care units. Portions of emergency departments where the initial triage occurs may be incorporated as part of the triage service while an assessment of potential infection and contamination is made prior to processing the suspected patient. Consideration for appropriate pressurization and air exchange rates to control contamination should be addressed.

A7.34.A2. Transportation of patients to and from the critical care unit should ideally be separated from public corridors and visitor waiting areas. In new construction, where elevator transport is required for critically ill patients, the size of the cab and mechanisms and controls should meet the specialized needs.

A7.34.A3. In critical care units, the size of the patient care space should be dependent upon the intended functional use. The patient space in critical care units, especially those caring for surgical patients following major trauma or cardiovascular, transplant, or orthopedic procedures, or medical patients simultaneously requiring ventilation, dialysis, and/or other large equipment (e.g., intra-aortic balloon pump) may be overwhelmed if designed to the absolute minimum clear floor area.

A staff emergency assistance system should be provided on the most accessible side of the bed. The system should annunciate at the nurse station with backup from another staffed area from which assistance can be summoned.

Provision should be made for rapid and easily accessible information exchange and communication within the unit and the hospital.

The unit should provide the ability to continuously monitor the physiological parameters appropriate for the types of patients the unit is expected to care for.

A7.34.A9. Patients should be visually observed at all times. This can be achieved in a variety of ways.

If a central station is chosen, it should be ~~geographically~~ located to allow for complete visual control of all patient beds in the critical care unit. It should be designed to maximize efficiency in traffic patterns. Patients should be oriented so that they can see the nurse but cannot see the other patients. There should be an ability to communicate with the clerical staff without having to enter the central station.

If a central station is not chosen, the unit should be designed to provide visual contact between patient beds so that there can be constant visual contact between the nurse and patient.

A7.~~3~~4.A12. To minimize distraction of those preparing medications, the area should be enclosed. A glass wall or walls may be advisable to permit ~~visualization~~ observation of patients and unit activities. A self-contained medicine~~-~~-dispensing unit may be located at the nurses station, in the clean workroom, in an alcove, or in another area directly under visual control of nursing or pharmacy staff.

A7.~~3~~4.A15. The recording, storage of bedside records (flowsheets, etc.), and review of clinical information is a vital function of a critical care unit. Space ~~near the bedside~~ for these functions should be provided near the bedside. Suitable space ergonomically designed is especially germane where computers are used for the clinical record.

A7.~~3~~4.A15.g. Equipment storage room or alcove. Appropriate room(s) or alcove(s) should be provided for storage of large items of equipment necessary for patient care and as required by the functional program. ~~Its~~ The location should not interfere with the flow of traffic. Work areas and storage of critical care supplies should be ~~in locations such that they are~~ readily accessible to nursing and physician staff. Shelving, file cabinets, and drawers should be ~~located so that they are~~ accessible to all requiring use. Separate areas need to be designed for the unit secretary and staff charting. Planning should consider the potential volume of staff (both medical and nursing) that could be present at any one time and translate that to adequate charting surfaces. The secretarial area should be accessible to all. However, the charting areas may be somewhat isolated to facilitate concentration. Storage for chart forms and supplies should be readily accessible. Space for computer terminals and printer and conduit for computer hook-up should be provided when automated information systems are in use or planned for the future. Patient records should be readily accessible to clerical, nursing, and physician staff. Alcoves should be provided for the storage and rapid retrieval of crash carts and portable monitor/defibrillator units. ~~Grounded e~~Electrical outlets should be provided in sufficient numbers to permit recharging stored battery-operated equipment.

A7.4.A15.i. Documentation space. The countertop area should be a minimum of 8 square feet (2.44 square meters). If a documentation space is to serve two patient beds, it should be a minimum of 10 square feet (3.05 square meters.

Information review space. There should be a minimum of 8 square feet (2.44 square meters) of countertop and seating to accommodate two people for every five patient beds it serves.

A7.4.A16.b. The offices should be large enough to permit consulting with members of the critical care team and visitors.

A7.~~3~~4.D2. ~~There should be~~Parent sleeping accommodations should be provided at ~~each child's~~the patient's bedside.

A7.4.D4. Formula storage may be outside the unit but should be available for use at all times. The functional program should determine the location and size of formula storage.

A7.4.D6. Space allowances for pediatric beds and cribs are greater than those for adult beds because of the variation in bed/crib sizes and the potential for change. The functional program may determine that general storage be provided in the pediatric critical care unit above the minimum required under 7.4.A15g.

~~**A7.3.D7.** Space allowances for pediatric beds and cribs are greater than those required for adult beds, because of the variations in sizes and the potential for change. Adequate storage is needed to accommodate the range of supplies and equipment needed to care for children of all ages.~~

A7.4.D.7. The number and location of examination/treatment rooms should be based on the functional program.

A7.4.E1. There should be efficient access to the unit from the labor and delivery area and emergency department or other referral entry points.

~~**A7.3.E6.** Infant bed areas and the spaces opening onto them should be designed to produce minimal background noise and to contain and absorb much of the transient noise that arises within the NICU. The combination of continuous background sound and transient sound in any patient care area should not exceed an hourly L_{eq} of 50 dB and an hourly L_{10} of 55 dB, both A-weighted slow response. The L_{max} (transient sounds) should not exceed 70 dB, A-weighted slow response.~~

~~**A7.3.E7.** Natural light should be provided in the NICU.~~

~~**A7.3.E15.** At least one transition room should be provided within or immediately adjacent to the NICU that allows parents and infants extended private time together. This room should have direct, private access to sink and toilet facilities, a bed for parents, communication linkage with NICU staff, and appropriate electric and medical gas outlets. The room(s) can be used for other family educational, counseling, parent sleeping, or demonstration purposes when not needed as a transition room.~~

A7.~~3~~4.E~~19~~18. Whenever possible, supplies should flow through special supply entrances from external corridors so that penetration of the semisterile zone by non-nursery personnel is unnecessary. Soiled materials should be sealed and stored in a soiled holding area until removed. This holding area should be located where there will be no need to pass back through the semisterile zone to remove the soiled materials.

~~**A7.4**~~

~~There should be a breastfeeding/pumping room readily available for mothers of NICU babies to pump breastmilk.~~

A7.~~4~~5.A7

When the functional program includes a mother-baby couplet approach to nursing care, the workroom functions described above may be incorporated into the nurse station that serves the postpartum patient rooms.

A7.5.B. When facilities use a rooming-in program in which all infants are returned to the nursery at night, a reduction in nursery size may not be practical.

A7.~~5~~6.

~~Recognizing~~ In view of their unique physical and developmental needs, pediatric and adolescent patients, to the extent their condition permits, should be grouped together in distinct units or distinct areas of general units separate from adults.

A7.~~5~~6.A

Family-support spaces, including family sleep rooms, pantry, toilets, showers, washers and dryers, and

access to computers, phones, and copy machines, should be provided.

A7.~~7~~9 ~~Surgical Suites~~Surgery

The size and location of the surgical procedure rooms shall be dependent on the level of care to be provided. The levels of care as defined by the American College of Surgeons are as follows:

Class A: Provides for minor surgical procedures performed under topical, local, or regional anesthesia without pre-operative sedation. Excluded are intravenous, spinal, and epidural routes; these methods are appropriate for Class B and Class C facilities.

Class B: Provides for minor or major surgical procedures performed in conjunction with oral, parenteral, or intravenous sedation or under analgesic or dissociative drugs.

Class C: Provides for major surgical procedures that require general or regional block anesthesia and support of vital bodily functions.

When bronchoscopy is performed on persons who are known or suspected to have pulmonary tuberculosis, the procedure room shall meet the airborne infection isolation room ventilation requirements.

When invasive procedures are known or suspected to have pulmonary tuberculosis, these procedures should not be performed in the operating suite. They should be performed in a room meeting airborne infection isolation room ventilation requirements or in a space using local exhaust ventilation. If the procedure must be performed in the operating suite, see the "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities."

A7.~~7~~9.B~~2~~. Separate and additional recovery space may be necessary to accommodate outpatients. If children receive care, recovery space should be provided for pediatric patients and the layout of the surgical suite should facilitate the presence of parents in the PACU.

A7.9.B1. The functional program may require additional clear space, plumbing, and mechanical facilities to accommodate special functions in one or more of these rooms. When existing functioning operating rooms are modified, and it is impractical to increase the square foot area because of walls or structural members, the operating room may continue in use when requested by the hospital.

A7.~~7~~9.~~B~~C2. Separate and additional recovery space may be necessary to accommodate patients. If children receive care, recovery space should be provided for pediatric patients and the layout of the surgical suite should facilitate the presence of parents in the PACU.

A7.~~7~~9.~~C~~D10. Equipment storage room(s) for equipment and supplies used in the surgical suite should be strategically located and sized for convenient access and utilization. In larger surgical suites, storage spaces should be located for ready access to specialty rooms.

A7.~~8~~10.
Obstetrical program models vary widely in their delivery methodologies. The models are essentially of three types. The following narrative describes the organizational framework of each model.

Traditional Model

Under the traditional model, labor, delivery, recovery, and postpartum occur in separate areas. The birthing woman is treated as the moving part. She is moved through these functional areas depending on the status of the birth process.

The functional areas are separate rooms consisting of the labor room, delivery room, recovery room, postpartum bedroom, and infant nurseries (levels determined by acuity).

Labor-Delivery-Recovery Model

All labor-delivery-recovery rooms (LDRs) are designed to accommodate the birthing process from labor through delivery and recovery of mother and baby. They are equipped to handle most complications, with the exception of cesarean sections.

The birthing woman moves only as a postpartum patient to her bedroom or to a cesarean section delivery room (surgical operative room) if delivery complications occur.

After the mother and baby are recovered in the LDR, they are transferred to a mother-baby care unit for postpartum stay.

Labor-Delivery-Recovery-Postpartum Model

Single--room maternity care in labor-delivery-recovery-postpartum rooms (LDRPs) adds a "P" to the LDR model. Room design and capability to handle most emergencies remain the same as the LDRs. However, the LDRP model eliminates a move to postpartum after delivery. LDRP uses one private room for labor, delivery, recovery, and postpartum stay.

Equipment is moved into the room as needed, rather than moving the patient to the equipped room. Certain deliveries are handled in a cesarean section delivery room (surgical operative room) should delivery complications occur.

A7.~~8~~10.A2.a(3). Unless the functional program demonstrates the therapeutic and social value of a multiple-bed~~ded~~ arrangement, the maximum number of beds per room should be one.

A7.10.A3.f(3)(c). High-speed autoclaves should only be used in an emergency situation (e.g., a dropped instrument and no sterile replacement readily available).

A7.10.A4. A minimum dimension of 15 feet (4.57 meters) is preferable to accommodate the equipment and staff needed for complex deliveries.

A7.~~9~~11.A. Classification of emergency departments/services/trauma centers

Basic aspects of previous Level I-IV emergency department/services classifications are still recognizable in current criteria statements but have evolved substantially to address changes in practice, needs, and technologies. The following publications are especially useful references for understanding and listing current refined and expanded requirements:

American College of Surgeons. "Trauma Center Descriptions and Their Roles in a Trauma System," chapter 2 in *Resources for Optimal Care of the Injured Patient* (ACS, 1999). This reference provides

detailed descriptions of Level I- Level IV trauma centers. (www.facs.org)

Riggs, Leonard M., Jr., ed. *Emergency Department Design* (American College of Emergency Physicians, 1993). The author discusses planning for various levels of treatment acuity. (www.acep.org)

A7.11.D. When advanced imaging technologies such as CT are available, the ED should have convenient access.

A7.11.D3. The design of the department is critical, particularly at the main public access point, to ensure that emergency medical staff and hospital security personnel maintain control of access at all times. In the event of a disaster, terrorist event, or infectious disease outbreak, the emergency service must remain under the control of the hospital and limit contamination to ensure its continued availability as a resource. Efforts will be made to separate patients waiting for triage in a secure area clearly visible from triage with appropriate ventilation. This area will be separate from the post-triage waiting area to limit the spread of contamination and/or contagion. While the triage station must have unobstructed visability of the waiting area to observe patients waiting for treatment, a reception and control or security function must be provided to monitor the main entrance to the department and all public areas. Public access points to the treatment area shall be minimal in number, and under direct observation by the reception and control or security function.

A7.~~9~~11.D8
Access needs to be convenient to ambulance entrance.

A7.~~9~~11.D16a
Disposal space for regulated medical waste~~,~~ (e.g., gauzes/linens soaked with body fluids)~~,~~ should be separate from routine disposal space.

A7.~~9~~11.D21
A security station and/or system should be located to maximize visibility of the treatment areas, waiting areas, and key entrance sites. The system should include visual monitoring devices installed both internally in the emergency department as well as externally at entrance sites and parking lots. Special requirements for a security station should include accommodation for hospital security staff, local police officers, and monitoring equipment. Design consideration should include installation of silent alarms, panic buttons, and intercom systems, and physical barriers such as doors to patient entry areas.

The security monitoring system should be included on the hospital's emergency power backup system.

In preparation for the emergence of highly infectious patients, hospitals should have the capacity to handle a surge of up to ten or a fourfold increase above the current emergency department capacity for such patients. This preparation should include the provision of adjacent space for triage and management of infectious patients. Utility upgrades for these areas (oxygen, water, electrical) should be considered. The area should provide for depressurization to help control aerosolized infectious particles with 100 percent exhaust capability. If 100 percent exhaust cannot be achieved, appropriate proven technology should be utilized to reduce airborne particles by > 95 percent. If patient care areas are to be utilized in the hospital to house these patients, the route to the patient care unit should minimize the potential for cross-contamination. Existing smoke control areas could be utilized to meet the ventilation requirements. If negative pressure machines are used, they shall be designed for specific applications for depressurizing rooms or areas. Written protocols must be developed to ensure proper performance of the means to accomplish the intended goals. DHHS, the Office of Emergency Preparedness, will have more up-to-date

information.

A7.911.D23. At least one bereavement room should be provided. This room should be accessible from both the emergency treatment corridor and the emergency waiting area. This room should be comfortable enough to provide respite to the bereaved family and should be equipped with a sound transmission coefficient equivalent to 65 for the walls and 45 for the floors and ceiling.

A7.11.D24. The room should be designed to prevent injury to patients. All finishes, light fixtures, vents and diffusers, and sprinklers should be completely tamper resistant. There should not be any electrical outlets, medical gas outlets, or similar devices. There should be no sharp corners, edges, or protrusions, and the walls should be free of objects or accessories of any kind. Patient room doors should swing out and should have hardware on the exterior side only, and doors should have an electric strike that is tied into the fire alarm.

A7.911.D25. Decontamination area on the exterior perimeter.

(1) Ideally 50 yards (45.72 meters) from the ambulance entrance (if required by the constraints of the structures involved, this may be no less than 10 yards (9.14 meters) from the ambulance entrance).

(2) At a location where no windows or doors abut the defined area or where all doors are securable from the outside and all windows are capable of being shuttered.

(3) Boundaries shall be defined on the paved ground surface with a yellow paint line and the word "DECON" painted within these boundaries.

(4) At least two shower heads, temperature-controlled and separated by at least 6 feet (1.83 meters); a separate spigot for attachment of a hose.

(5) Semipermanent or portable/collapsible structures (curtains, tents, etc.) that will provide both shelter from the environment, privacy, and some containment of the contaminant/infectious agent.

(6) Secured access to the hospital telephone system and a duplex electrical outlet for each two shower heads and no closer than 4 feet (1.22 meters) to any shower.

(7) Exterior lighting to maximize visibility; appropriate for wet/shower facilities.

(8) Negative airflow and ventilation system on the hospital perimeter wall but drawing air within the confines of the decontamination structure; exhausted directly to the outdoors, no less than 50 feet (15.24 meters) away from the decontamination site with no recirculation of air. This system shall be defunctionalized when the decontamination structure is not in use.

(9) Water runoff shall be contained and disposed of safely to ensure that it does not enter community drainage systems. This shall be accomplished either by graded floor structures leading to a drain with a collection system separate from that of the hospital or by the use of plastic pools or specialized decontamination stretchers.

Decontamination room within the facility

(1) Separate, independent, secured external entrance adjacent to the ambulance entrance, but no less than

10 yards (9.14 meters) distant; lighted and protected from the environment in the same way as the ambulance entrance; a yellow painted boundary line 3 feet (0.91 meter) from each side of the door and extending 6 feet (1.83 meters) from the hospital wall; the word "DECON" painted within these boundaries.

(2) Internal entrance to a corridor within the emergency area.

(3) It shall have spatial requirements and the medical support services of a standard emergency area airborne infection isolation room, with air externally exhausted separate from the hospital system. It shall contain a work counter, handwashing station with hands-free controls, an area for personnel gowning, and a storage area for supplies, as well as equipment for the decontamination process.

(4) Ceiling, wall, and floor finishes shall be smooth, nonporous, scrubbable, nonadsorptive, nonperforated, capable of withstanding cleaning with and exposure to harsh chemicals, nonslip, and without crevices or seams. Floors shall be self-coving to a height of 6 inches (152.4 millimeters). The surface of the floor shall be self-finished and require no protective coating for maintenance.

(5) Two hospital telephones; two duplex electrical outlets, secured appropriately for a wet environment.

(6) At least two hand-held shower heads, temperature-controlled; curtains or other devices to allow patient privacy, to the extent possible.

(7) Appropriately heated and air-cooled for a room with an external door and very high ~~Rh~~relative humidity.

(8) Water drainage must be contained and disposed of safely to ensure that it does not enter the hospital or community drainage systems. There should be a "saddle" at the floor of the door buck to prevent efflux.

(9) A certified physicist or other qualified expert representing the owner or the state agency shall specify the type, location, and amount of radiation protection to be installed in accordance with final approved department layout and the functional program. These specifications shall be incorporated into the plans.

(10) The decontamination area may function as an isolation room or a patient hygiene room under routine departmental function.

A7.11.D26. Provisions for the treatment of pediatric cases in dedicated pediatric rooms within the unit should be provided. The quantity of dedicated rooms should depend on the census of the particular institution. Pediatric designated rooms should be adjacent to a family waiting area and toilet. Particular attention should be paid to the soundproofing of these rooms. Where possible, rooms should be sized larger than 120 square feet (11.15 square meters) of clear area (exclusive of casework) to accommodate the additional equipment and escorts that accompany pediatric cases.

A7.~~9~~11.E. A decontamination room for both chemical and radiation exposure. This room should have a separate entrance to the emergency department~~,~~ and an independent, closed drainage system. A negative airflow and ventilation system separate and distinct from the hospital system should be provided. Spatial requirements should allow for at least one stretcher, several hospital staff, two shower heads, and an adjacent locked storage area for medical supplies and equipment. When provided, solid lead-lined walls and doors should meet the requirements of a certified physicist or other qualified expert representing the owner or state agency.

A separate pediatric emergency area. This area should include space for registration, discharge, triage, waiting, and a playroom. An area for the nurse station and physician station, storage for supplies and medication, and one to two isolation rooms should also be included. Each examination/treatment room should be 100 square feet (9.29 square meters) of clear floor space, with a separate procedure/trauma room of 120 square feet (11.15 square meters) of clear floor space; each of these rooms should have handwashing stations;~~,~~ vacuum, oxygen, and air outlets;~~,~~ examination lights;~~,~~ and wall/column mounted ophthalmoscopes/otoscopes. At least one room for pelvic examinations should be included. X-ray illuminators should be available.

Observation/holding units for patients requiring observation up to 23 hours or admission to an inpatient unit. This area should be located separately but near the main emergency department. The size will depend upon the function (observation and/or holding), patient acuity mix, and projected utilization. As defined by the functional plan, this area should consist of a centralized nurse station; 100 square feet (9.29 square meters) of clear floor space for each cubicle, with vacuum, oxygen, and air outlets, monitoring space, and nurse call buttons. A patient bathroom should be provided. Storage space for medical and dietary supplies should be included. X-ray illuminators should be available.

A separate fast-~~-~~track area when annual emergency department visits exceed 20-30,000 visits should be considered. This area should include space for registration, discharge, triage, and waiting, as well as a physician/nurse work station. Storage areas for supplies and medication should be included. A separate treatment/procedure room of 120 square feet (11.15 square meters) of clear floor space should be provided. Examination/treatment areas should be 100 square feet (9.29 square meters) of clear floor space, with handwashing stations, vacuum, oxygen, and air outlets, and examination lights. At least one treatment/examination room should be designated for pelvic examinations.

A patient hygiene room with shower and toilet facilities.

A7.~~10~~12.A1. Layouts should be developed in compliance with manufacturer's recommendations because area requirements may vary from machine to machine. Since technology changes frequently and from manufacturer to manufacturer, rooms can be sized larger to allow upgrading of equipment over ~~a period of~~ time.

A7.~~10~~12.A3. Particular attention should be paid to the management of outpatients for preparation, holding, and observation. The emergency, surgery, cystoscopy, and outpatient clinics should be accessible to the imaging suite. Imaging should be located on the ground floor, if practical, because of equipment ceiling height requirements, close proximity to electrical services, and expansion considerations.

A7.~~10~~12.B1. The procedure room should be a minimum of 400 square feet (37.16 square meters).

A7.~~10~~12.B3. Viewing areas should be a minimum of 10 feet (3.05 meters) in length.

A7.~~10~~12.B5. A patient holding area should be provided to accommodate two stretchers with additional spaces for additional procedure rooms.

A7.~~10~~12.D1. Radiography rooms should be a minimum of 180 square feet (7.43 square meters). (Dedicated chest X-ray may be smaller.)

A7.~~10~~12.D2. Tomography and ~~R~~radiography/~~F~~fluoroscopy (R&F) rooms should be a minimum of 250

square feet (23.23 square meters).

A7.~~10~~12.D3. Mammography rooms should be a minimum of 100 square feet (9.29 square meters).

A7.~~10~~12.E2. Control rooms should be a minimum of 100 square feet (9.29 square meters), but may be larger depending on the vendor and magnet size.

A7.~~10~~12.E3. A computer room may range from 150 square feet (13.94 square meters) to 380 square feet (35.30 square meters) depending on the vendor and magnet strength. Self-contained air conditioning supplement is normally required.

A7.~~10~~12.E4. Cryogen storage may be required in areas where service to replenish supplies is not readily available. When provided, space should be a minimum of 50 square feet (4.65 square meters) to accommodate two large dewars of cryogen.

A7.~~10~~12.E5. A darkroom may be required for loading cassettes and shall be located near the control room. This darkroom shall be outside the 10-gauss field.

A7.~~10~~12.E7. Power conditioning and voltage regulation equipment as well as direct current (DC) may be required.

A7.~~10~~12.E8. Magnetic shielding may be required to restrict the magnetic field plot. Radio frequency shielding may be required to attenuate stray radio frequencies. The area around, above and below the MRI suite shall be reviewed and evaluated for the following:

- Possible occupancy by person(s) who could have pacemakers or other metal implants.
- Equipment that can be disrupted by a magnetic field. Examples include but are not limited to personal computers, monitors, CT scanners, and nuclear cameras.

After reviewing and evaluating the surrounding space, appropriate magnetic shielding should be provided based upon the type of MRI scanner to be installed.

A7.~~10~~12.E9. When patient holding areas are provided, they should be located near the MRI unit and should be large enough to accommodate stretcher(s).

A7.14.A. Nuclear medicine may include positron emission tomography, which is not common to most facilities. It requires specialized planning for equipment.

A7.~~11~~14.F. Space should be provided as necessary to accommodate the functional program. PET scanning is generally used in experimental settings and requires space for a scanner and for a cyclotron. The scanner room should be a minimum of 300 square feet (27 square meters).

Where a cyclotron room is required, it should be a minimum of 225 square feet (20.90 square meters) with a 16 square foot (4.88 square meter) space safe for storage of parts which may need to cool down for a year or more.

Both a hot (radioactive) lab and a cold (nonradioactive) lab may be required, each a minimum of 250 square feet (23.23 square meters).

A blood lab of a minimum of 80 square feet (7.43 square meters) should be provided.

A patient holding area to accommodate two stretchers should be provided.

A gas storage area large enough to accommodate bottles of gas should be provided. Each gas will be piped individually and may go to the cyclotron or to the lab. Ventilation adequate for the occupancy is required. Compressed air may be required to pressurize a water circulation system.

Significant radiation protection may be required, since the cyclotron may generate high radiation.

Special ventilation systems together with monitors, sensors, and alarm systems may be required to vent gases and chemicals.

The heating, ventilating, and air conditioning system will require particular attention; highest pressures should be in coldest (radiation) areas and exhaust should be in hottest (radiation) areas. Redundancy may be important.

The cyclotron is water cooled with de-ionized water. A heat exchanger and connection to a compressor or connection to chilled water may be required. A redundant plumbing system connected to a holding tank may be required to prevent accidental leakage of contaminated water into the regular plumbing system.

A7.14.G2. The darkroom should contain protective storage facilities for unexposed film that guard the film against exposure or damage.

A7.14.G10. Thought should be given to entertainment and reading materials.

A7.14.H1. Equipment manufacturers' recommendations should be sought and followed, since space requirements may vary from one machine to another and one manufacturer to another. The radiotherapy suite may contain electron beam therapy or radiation therapy, or both. Although not recommended, a simulation room may be omitted in small linear accelerator facilities where other positioning geometry is provided.

A7.~~11~~14.H4. Minimum size should be 260 square feet (24.15 square meters) for the simulator room. Minimum size, including the maze, should be 680 square feet (63.17 square meters) for accelerator rooms and 450 square feet (41.81 square meters) for cobalt rooms.

7.~~12~~15 Laboratory Suite

Laboratory facilities shall be provided for the performance of tests in hematology, clinical chemistry, urinalysis, microbiology, anatomic pathology, cytology, and blood banking to meet the workload described in the functional program. Certain procedures may be performed on-site or provided through a contractual arrangement with a laboratory service acceptable to the authority having local jurisdiction.

Provisions shall be made for the following procedures to be performed on-site: blood counts, urinalysis, blood glucose, electrolytes, blood urea and nitrogen (BUN), coagulation, ~~and~~ transfusions (type and cross-match capability), and STAT gram stains. Provisions shall also be included for specimen collection and processing.

The functional program shall describe the type and location of all special equipment that is to be wired, plumbed, or plugged in, and the utilities required to operate each.

Note: Refer to NFPA code requirements applicable to hospital laboratories, including standards clarifying that hospital units do not necessarily have the same fire safety requirements as commercial chemical laboratories.

The following physical facilities shall be provided within the hospital:

7~~.12.~~.15.A.
Laboratory work counter(s) with space for microscopes, appropriate chemical analyzer(s), incubator(s), centrifuge(s), biosafety hoods, etc. ~~shall be provided.~~ Work areas shall include sinks with water and access to vacuum, gases, and air, and electrical services as needed.

7~~.12.~~.15.B.
Refrigerated blood storage facilities for transfusions ~~shall be provided~~. Blood storage refrigerator shall be equipped with temperature-monitoring and alarm signals.

7~~.12.~~.15.C.
~~Lavatory(ies) or counter sink(s) equipped for handwashing shall be provided. Counter sinks may also be used are permitted for disposal of nontoxic fluids.~~Dedicated handwashing stations shall be provided within 25 feet (7.62 meters) of each work station and within each room.

***7~~.12.~~.15.D.**
Storage facilities, including refrigeration, for reagents, standards, supplies, and stained specimen microscope slides, etc. ~~shall be provided.~~ Such facilities shall conform to applicable NFPA standards.

7~~.12.~~.15.E.
A ~~S~~specimen (blood, urine, and feces) collection facility ~~shall be provided~~. The ~~B~~blood collection area shall have a work counter, space for patient seating, and handwashing stations. The ~~U~~urine and feces collection ~~room~~ facility shall be equipped with a water closet and ~~lavatory~~handwashing station. This facility may be located outside the laboratory suite.

7~~.12.~~.15.F.
Chemical safety provisions including emergency shower, eyeflushing devices, and appropriate storage for flammable liquids, etc.~~, shall be made~~.

7.~~12.~~.15.G.
Facilities and equipment for terminal sterilization of contaminated specimens before transport (autoclave or electric oven)~~ shall be provided~~. (Terminal sterilization is not required for specimens that are incinerated on-site.)

7.~~12.~~.15.H.
If radioactive materials are employed, facilities ~~shall be available~~ for long-term storage and disposal of these materials. No special provisions will normally be required for body waste products from most patients receiving low-~~-~~level isotope diagnostic material. Requirements of authorities having jurisdiction should be verified.

7.~~12.~~.15.I.
Administrative areas including offices as well as space for clerical work, filing, and record maintenance ~~shall be provided~~.

7.~~12.~~.15.J.
Lounge, locker, and toilet facilities ~~shall be~~ conveniently located for male and female laboratory staff. These may be outside the laboratory area and shared with other departments.

~~The functional program shall describe the type and location of all special equipment that is to be wired, plumbed, or plugged in, and the utilities required to operate each.~~

~~**Note**: Refer to NFPA code requirements applicable to hospital laboratories, including standards clarifying that hospital units do not necessarily have the same fire safety requirements as commercial chemical laboratories.~~

7.~~13~~16 Rehabilitation Therapy Department

7.~~13.~~.16.A. General
Rehabilitation therapy is primarily for restoration of body functions and may contain one or several categories of services. If a formal rehabilitative therapy service is included in a project, the facilities and equipment shall be as necessary for the effective function of the program. Where two or more rehabilitative services are included, items may be shared, as appropriate.

7.~~13.~~.16.B. Common Elements
Each rehabilitation~~ve~~ therapy department shall include the following, which may be shared or provided as separate units for each service:

7.~~13.~~.16.B1. Office and clerical space with provision for filing and retrieval of patient records.

7.~~13.~~.16.B2. Reception and control station(s) with visual control of waiting and activities areas. (This may be combined with office and clerical space.)

7.~~13.~~.16.B3. Patient waiting area(s) out of traffic with provision for wheelchairs.

7.~~13.~~.16.B4. Patient toilets with handwashing stations accessible to wheelchair patients.

7.~~13.~~.16.B5. Space(s) for storing wheelchairs and stretchers out of traffic while patients are using the services. These spaces may be separate from the service area but must be conveniently located.

7~~.13.~~.16.B6. A conveniently accessible housekeeping room and service sink for housekeeping use.

7~~.13.~~.16.B7. Locking closets or cabinets within the vicinity of each work area for securing staff personal effects.

7~~.13.~~.16.B8. Convenient access to toilets and lockers.

7~~.13.~~.16.B9. Access to a demonstration/conference room.

7~~.13.~~.16.C. Physical Therapy
If physical therapy is part of the service, the following, at least, shall be ~~included~~provided:

7~~.13.~~.16.C1. Individual treatment area(s) with privacy screens or curtains. Each such space shall have not less than 70 square feet (6.51 square meters) of clear floor area.

7~~.13.~~.16.C2. Handwashing stations for staff either within or at each treatment space. ~~(One handwashing station may serve several treatment stations.)~~Each treatment room shall have at least one handwashing station.

7~~.13.~~.16.C3. Exercise area and facilities.

7~~.13.~~.16.C4. Clean linen and towel storage.

7~~.13.~~.16.C5. Storage for equipment and supplies.

7~~.13.~~.16.C6. Separate storage for soiled linen, towels, and supplies.

7~~.13.~~.16.C7. If required by the functional program, patient dressing areas, showers, and lockers. ~~These~~ They shall be accessible and usable by the disabled.

7~~.13.~~.16.C8. If required by the functional program, ~~P~~provisions ~~shall be made~~ for thermotherapy, diathermy, ultrasonics, and hydrotherapy~~ when required by the functional program~~.

7~~.13.~~.16.D. Occupational Therapy
If ~~this~~ occupational therapy is part of the service~~ is provided~~, the following, at least, shall be provided~~included~~:

7~~.13.~~.16.D1. Work areas and counters suitable for wheelchair access.

7~~.13.~~.16.D2. Handwashing stations.

7~~.13.~~.16.D3. Storage for supplies and equipment.

***7~~.13.~~.16.D4.** An area for teaching daily living activities~~ shall be provided~~. It shall contain an area for a bed, kitchen counter with appliances and sink, bathroom, and a table/chair.

7~~.13.~~.16.E. Prosthetics and Orthotics
If ~~this~~ prosthetics and orthotics is part of the service~~ is provided~~, the following, at least, shall be

~~included~~provided:

7~~.13.~~.16.E1. Workspace for technicians.

7~~.13.~~.16.E2. Space for evaluating and fitting, with provision for privacy.

7~~.13.~~.16.E3. Space for equipment, supplies, and storage.

7~~.13.~~.16.F. Speech and Hearing
If ~~this~~ speech and hearing is part of the service is ~~provided~~, the following, at least, shall be ~~included~~provided:

7~~.13.~~.16.F1. Space for evaluation and treatment.

7~~.13.~~.16.F2. Space for equipment and storage.

7.~~14~~17 Renal Dialysis Unit (Acute and Chronic)

7~~.14.~~.17.A. General

7~~.14.~~.17.A1. ~~The number of dialysis stations shall be based upon the expected workload and may include several work shifts per day.~~Equipment and space shall be provided as necessary to meet the functional program.

7~~.14.~~.17.A2. The location shall offer convenient access for outpatients. Accessibility to the unit from parking and public transportation shall be a consideration.

7~~.14.~~.17.A3. Space and equipment shall be provided as necessary to accommodate the functional programs, which may include acute (inpatient ~~services~~) and chronic cases, home treatment, and kidney dialyzer reuse facilities. Inpatient services ~~(acute) may be performed~~are permitted in critical care units and designated areas in the hospital, with appropriate utilit~~y~~ies.

7~~.14.~~.17.B. Treatment Area

7~~.14.~~.17.B1. The treatment area may be an open area and shall be separate from administrative and waiting areas.

7~~.14.~~.17.B2. Nurse~~'~~s station(s) shall be located within the dialysis treatment area and designed to provide visual observation of all patient stations.

7~~.14.~~.17.B3. Individual patient treatment areas shall contain at least 80 square feet (7.44 square meters). The 80 square feet (7.44 square meters) shall be exclusive of general circulation space within the ward. There shall be at least a 4-foot (1.22 meters) space between beds and/or lounge chairs.

7~~.14.~~.17.B4. Handwashing stations shall be convenient to the nurses station and patient treatment areas. There shall be at least one handwashing station serving no more than four stations. The~~se~~ handwashing stations shall be uniformly distributed to provide equal access from each patient station.

7~~.14.~~.17.B5. The open unit shall be designed to provide privacy for each patient.

7~~.14.~~.17.B6. The number of and need for required airborne infection isolation rooms shall be determined by an ~~Infection Control Risk Assessment (~~ICRA~~)~~. When required, the airborne infection isolation room(s) shall comply with the requirements of Section 7.2.C.

7~~.14.~~.17.B7. If required by the functional program, there shall be a medication dispensing station for the dialysis center. A work counter and handwashing stations shall be included in this area. Provisions shall be made for the controlled storage, preparation, distribution, and refrigeration of medications.

7~~.14.~~.17.B8. If home training is provided in the unit, a private treatment area of at least 120 square feet (11.15 square meters) shall be provided for patients who are being trained to use dialysis equipment at home. This room shall contain a counter, handwashing stations, and a separate drain for fluid disposal.

7~~.14.~~.17.B9. An examination room with handwashing stations and writing surface shall be provided with at least 100 square feet (9.29 square meters).

7~~.14.~~.17.B10. A clean workroom shall be provided. If the room is used for preparing patient care items, it shall contain a work counter, a handwashing station, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and handwashing station may be omitted. Soiled and clean workrooms or holding rooms shall be separated and have no direct connection.

7~~.14.~~.17.B11. A soiled workroom shall be provided and contain a flushing-rim sink, handwashing station, work counter, storage cabinets, waste receptacles, and a soiled linen receptacle.

7~~.14.~~.17.B12. If dialyzers are reused, a reprocessing room ~~is required and~~ sized to perform the functions required shall be provided.~~and~~ This room shall include a one-way flow of materials from soiled to clean with provisions for ~~a~~ refrigeration (temporary storage or dialyzer), decontamination/cleaning areas, sinks, processors, computer processors and label printers, packaging area, and dialyzer storage cabinets.

7~~.14.~~.17.B13. If a nourishment station for the dialysis service is provided, the nourishment station shall contain a ~~sink~~handwashing station, a work counter, a refrigerator, storage cabinets, a water-dispensing unit separate from the handwashing station, and equipment for serving nourishments as required. The nourishment station shall be located away from the treatment area to prevent the risk of cross-contamination.

7~~.14.~~.17.B14. An environmental services closet shall be provided adjacent to and for the exclusive use of the unit. The closet shall contain a floor receptor or service sink and storage space for housekeeping supplies and equipment. Water supply and drain connection for testing machines shall be provided.

7.17.B15. If a stat laboratory for blood and urinalysis is provided, the stat laboratory shall contain a handwashing station, work counters, storage spaces, an undercounter refrigerator for specimens, and a cup sink. An area for the phlebotomists' use shall be provided adjacent to the laboratory. A pass-through for specimens shall be provided between the lavatory and the laboratory.

7~~.14.~~.17.B1~~5~~6. If required by the functional program, an equipment repair and breakdown room shall be equipped with a handwashing station, deep service sink, work counter, and storage cabinet.

7~~.14.~~.17.B1~~6~~7. Supply areas or supply carts shall be provided.

7~~.14.~~.17.B1~~7~~8. If stretchers are provided, ~~S~~storage space shall be available for wheelchairs and stretchers, ~~if stretchers are provided,~~ out of direct line of traffic.

7~~.14.~~.17.B1~~8~~9. A clean linen storage area shall be provided. ~~This~~ It may be within the clean workroom, a separate closet, or an approved distribution system. If a closed cart system is used, storage may be in an alcove. It must be out of the path of normal traffic and under staff control.

7~~.14.~~.17.B~~19~~20. Each facility using a central batch delivery system shall provide, either on the premises or through written arrangements, individual delivery systems for the treatment of any patient requiring special dialysis solutions. The mixing room ~~should~~shall ~~also~~ include a sink, storage space, and holding tanks.

7~~.14.~~.17.B2~~0~~1. The water treatment equipment shall be located in an enclosed room.

7~~.14.~~.17.B2~~1~~2. A patient toilet with handwashing stations shall be provided.

***7~~.14.~~.17.B2~~2~~3.** Piping. Design consideration shall be given to the disposal of liquid waste from the dialyzing process to prevent odor and backflow.

***7.17.B24.** Temperature and humidity.

7~~.14.~~.17.C. Ancillary Facilities

7~~.14.~~.17.C1. Appropriate staff clothing change areas and lounge ~~areas~~ shall be available for male and female personnel ~~for staff clothing change area and lounge~~. The areas shall contain lockers, shower, toilet, and handwashing stations.

7~~.14.~~.17.C2. Storage for patients' belongings shall be provided.

7~~.14.~~.17.C3. A waiting room, toilet room with handwashing stations, drinking fountain, public telephone, and seating accommodations for waiting periods shall be available or accessible to the dialysis unit.

7~~.14.~~.17.C4. Office and clinical work~~-~~space shall be available for administrative services.

7.17.C6. If required by the functional program, a laboratory space, including counters, sinks, cabinets, label machines, computers, and handwashing sinks, shall be provided to accommodate processing of blood draws and urine samples.

7.~~15~~ 18 Respiratory Therapy Service

The type and extent of respiratory therapy service in different institutions vary greatly. In some, therapy is delivered in large sophisticated units, centralized in a specific area; in others, basic services are provided only at patients' bedsides. If respiratory service is provided, the following elements shall be ~~included~~ provided as a minimum, in addition to those elements stipulated in Sections 7~~.13.~~.16.B1, 7, 8, and 9:

7~~.15.~~.18.A. Storage for Equipment and Supplies

7~~.15.~~.18.B. Space and Utilities for Cleaning and Disinfecting Equipment

~~Provide physical separation of t~~The space for receiving and cleaning soiled materials shall be physically separated from the space for storage of clean equipment and supplies. Appropriate local exhaust ventilation shall be provided if gluteraldehyde or other noxious disinfectants are used in the cleaning process.

~~**7.15.C.**~~
~~Respiratory services shall be conveniently accessible on a 24-hour basis to the critical care units.~~

7~~.15.~~.18.~~D~~C. Outpatient Testing and Demonstration
If respiratory services such as testing and demonstration for outpatients are part of the program, additional facilities and equipment shall be provided as necessary for the appropriate function of the service, including but not limited to:

7~~.15.~~.18.~~D~~C1. Patient waiting area with provision for wheelchairs.

7~~.15.~~.18.~~D~~C2. A reception and control station.

7~~.15.~~.18.~~D~~C3. Patient toilets and handwashing stations.

7~~.15.~~.18.~~D~~C4. Room(s) for patient education and demonstration.

7~~.15.~~.18.~~E~~D. Cough-Inducing and Aerosol-Generating Procedures
All cough-inducing procedures performed on patients who may have infectious *Mycobacterium tuberculosis* shall be performed in rooms using local exhaust ventilation devices~~,~~ (e.g., booths or special enclosures with discharge HEPA filters and exhaust directly to the outside). If a ventilated booth is used, the air exchange rate within the booth shall be at least 12 air changes per hour, with a minimum exhaust flow rate of 50 cfm and differential pressure of 0.01" w.c. (2.5 Pa). These procedures may also be performed in a room that meets the ventilation requirements for airborne infection control. See Table 7.2 for airborne infection isolation room ventilation requirements.

7.~~16~~19 Morgue

These facilities shall be accessible through an exterior entrance and shall be located to avoid the need for transporting bodies through public areas.

7~~.16.~~.19.A.
If autopsies are performed in the hospital, ~~T~~the following elements shall be provided~~ when autopsies are performed in the hospital~~:

7~~.16.~~.19.A1. Refrigerated facilities for body holding. Body-holding refrigerators shall be equipped with temperature-monitoring and alarm singnals.

7~~.16.~~.19.A2. An autopsy room containing the following:

a. A work counter with a ~~sink equipped for~~ handwashing station.

b. A storage space for supplies, equipment, and specimens.

c. An autopsy table.

d. A deep sink for washing ~~of~~ specimens.

7~~.16.~~.19.A3. A housekeeping service sink or receptor for cleanup and housekeeping.

***7~~.16.~~.19.B.**
If autopsies are performed outside the facility, a well-ventilated, temperature-controlled~~,~~ body-holding room shall be provided.

7.~~17~~20 Pharmacy

7~~.17.~~.20.A. General
The size and type of services to be provided in the pharmacy will depend upon the type of drug distribution system used, number of patients to be served, and extent of shared or purchased services. ~~This~~ These factors shall be described in the functional program. The pharmacy room or suite shall be located for convenient access, staff control, and security. Facilities and equipment shall be as necessary to accommodate the function~~s of the~~al program. (Satellite facilities, if provided, shall include those items required by the program.) As a minimum, the following elements shall be ~~included~~provided:

7~~.17.~~.20.B. Dispensing

7~~.17.~~.20.B1. A pickup and receiving area.

7~~.17.~~.20.B2. An area for reviewing and recording.

***7~~.17.~~.20.B3.** An extemporaneous compounding area that includes a sink and sufficient counter space for drug preparation. ~~Floor drainage may also be required, depending on the extent of compounding conducted.~~

7~~.17.~~.20.B4. Work counters and space for automated and manual dispensing activities.

7~~.17.~~.20.B5. An area for temporary storage, exchange, and restocking of carts.

7~~.17.~~.20.B6. Security provisions for drugs and personnel in the dispensing counter area.

7.20.B7. A room for receiving, breakout, and inventory control of materials used in the pharmacy shall be provided.

7~~.17.~~.20.C. Manufacturing

7~~.17.~~.20.C1. A bulk compounding area.

7~~.17.~~.20.C2. Provisions for packaging and labeling.

7~~.17.~~.20.C3. A quality-control area.

7~~.17.~~.20.D. Storage
~~Storage (may be c~~Cabinets, shelves, and/or separate rooms or closets~~)~~.

7~~.17.~~.20.D1. Bulk storage.

7~~.17.~~.20.D2. Active storage.

7~~.17.~~.20.D3. Refrigerated storage.

7~~.17.~~.20.D4. Volatile fluids and alcohol storage constructed according to applicable fire safety codes for the substances involved.

7~~.17.~~.20.D5. Secure storage for narcotics and controlled drugs.

7~~.17.~~.20.D6. Storage for general supplies and equipment not in use.

7~~.17.~~.20.E. Administration

7~~.17.~~.20.E1. Provision for cross-checking of medication and drug profiles of individual patients.

7~~.17.~~.20.E2. Poison control, reaction data, and drug information centers.

7~~.17.~~.20.E3. A separate room or area for office functions.~~;~~ This room shall include space to accommodate a~~ing~~ desk, filing capabilities, communication equipment, and reference materials.

7~~.17.~~.20.E4. Provisions for patient counseling and instruction (may be in a room separate from the pharmacy).

7~~.17.~~.20.E5. A room for education and training (may be ~~in~~ a multipurpose room shared with other departments).

7~~.17.~~.20.F. Other

7~~.17.~~.20.F1. Handwashing stations ~~shall be provided~~ within each separate room where open medication is handled.

7~~.17.~~.20.F2. ~~Provide for c~~Convenient access to toilet and locker.

7~~.17.~~.20.F3. If unit dose procedure is used, ~~provide~~ additional space and equipment for supplies, packaging, labeling, and storage, as well as for the carts.

7~~.17.~~.20.F4. If intravenous (IV) solutions are prepared in the pharmacy, ~~provide~~ a sterile work area with a laminar-flow workstation designed for product protection. The laminar-flow system shall include a nonhydroscopic filter rated at 99.97 percent (HEPA), as tested by dioctyl~~-~~phtalate (DOP) tests, and have a visible pressure gauge for detection of filter leaks or defects.

7~~.17.~~.20.F5. ~~Provide for consultation and patient education when~~ If the functional program requires dispensing of medication to outpatients, an area for consultation and patient education.

7.~~18~~21 Dietary Facilities

*7~~.18.~~.21.A. General

Food service facilities and equipment shall conform ~~with~~ to these standards and ~~with~~ to the standards of the National Sanitation Foundation and other appropriate codes and shall provide food service for staff, visitors, inpatients, and outpatients as ~~may be~~ appropriate.

~~Consideration may also be required for meals to VIP suites, and for cafeterias for staff, ambulatory patients, and visitors as well as providing for nourishments and snacks between scheduled meal service.~~

Patient food preparation areas shall be located in an area adjacent to delivery, interior transportation, and storage~~, etc~~.

Finishes in the dietary facility shall be selected to ensure cleanability and the maintenance of sanitary conditions.

7~~.18.~~.21.B. Functional Elements
If on-site conventional food service preparation is used, the following shall be provided, in size and number appropriate for the functional program~~approved function shall be provided~~:

7~~.18.~~.21.B1. Receiving/control stations. ~~Provide a~~An area for ~~the~~ receiving and control of incoming dietary supplies shall be provided. This area shall be separated from the general receiving area and shall contain ~~the following:~~ a control station and a breakout for loading, uncrating, and weighing supplies.

7~~.18.~~.21.B2. Storage spaces. They shall be convenient to the receiving area and shall be accessible without traveling ~~located to exclude traffic~~ through the food preparation area~~ to reach them~~. Storage spaces for bulk, refrigerated, and frozen foods shall be provided. A minimum of four days' supplies shall be stocked. ~~(In remote areas, this number may be increased to accommodate length of delivery in emergencies.)~~

Food storage components shall be grouped for convenient access from receiving and to the food preparation areas.

All food shall be stored clear of the floor. Lowest shelf shall be not less than 12 inches (300 millimeters) above the floor or shall be closed in and sealed tight for ease of cleaning.

7~~.18.~~.21.B3. Cleaning supplies storage. ~~Provide a~~A separate storage room shall be provided for the storage of non~~-~~food items such as cleaning supplies that might contaminate edibles.

7~~.18.~~.21.B4. Additional storage rooms. They shall be provided as necessary for the storage of cooking wares, extra trays, flatware, plastic and paper products, and portable equipment.

7~~.18.~~.21.B5. Food preparation work spaces. ~~Provide w~~Work spaces shall be provided for food preparation, cooking, and baking. These areas shall be as close as possible to the user (i.e., tray assembly and dining). ~~Provide a~~Additional spaces shall be provided for thawing and portioning.

7~~.18.~~.21.B6. Assembly and distribution. ~~Provide a~~A patient tray assembly area ~~and~~ shall be ~~locate within~~ close ~~proximity~~ to the food preparation and distribution areas.

7~~.18.~~.21.B7. Food service carts. A cart distribution system shall be provided, with spaces for storage, loading, distribution, receiving, and sanitizing of the food service carts. The cart traffic shall be designed to eliminate any danger of cross-circulation between outgoing food carts and incoming, soiled carts, and

the cleaning and sanitizing process. Cart circulation shall not be through food processing areas.

7~~.18.~~.21.B8. Dining area. ~~Provide d~~Dining space(s) shall be provided for ambulatory patients, staff, and visitors. These spaces shall be separate from the food preparation and distribution areas.

7~~.18.~~.21.B9. Vending services. If vending devices are used for unscheduled meals, provide a separate room that can be accessed without having to enter the main dining area. The vending room shall contain coin-operated machines, bill changers, a handwashing station, and a sitting area. Facilities for the servicing and sanitizing of the machines shall be provided as part of the facility's food service program~~ of the facility~~.

7~~.18.~~.21.B10. Area for receiving, scraping, and sorting soiled tableware. They shall be adjacent to ware washing and separate from food preparation areas.

7~~.18.~~.21.B11. Ware-washing facilities. They shall be designed to prevent contamination of clean wares with soiled wares through cross-traffic. The clean wares shall be transferred for storage or use in the dining area without having to pass through food preparation areas.

7~~.18.~~.21.B12. Pot--washing facilities. These shall include~~ing~~ multi-compartmented sinks of adequate size for the intended use, ~~shall be provided~~ convenient to the using service. Supplemental heat for hot water to clean pots and pans ~~may~~ shall be by booster heater, ~~or by~~ steam jet, or other appropriate means.

Mobile carts or other provisions ~~should~~ shall be made for drying and ~~storage~~ storing ~~of~~ pots and pans.

7~~.18.~~.21.B13. Waste storage room. A food waste storage room shall be ~~conveniently~~ located convenient to the food preparation and ware--washing areas but not within the food preparation area. It shall have direct access to the hospital's waste collection and disposal facilities.

7~~.18.~~.21.B14. Handwashing stations. Hands-free ~~Fixtures that are~~ operable ~~without the use of hands~~handwashing stations shall be ~~located~~ conveniently accessible at locations throughout the unit.

7~~.18.~~.21.B15. Office spaces. Offices for the use of the food service manager shall be provided. In smaller facilities, this space may be located in an area that is part of the food preparation area.

7~~.18.~~.21.B16. Toilets, ~~and~~ lockers, and lounges~~ spaces~~. Toilets, lockers and lounge facilities shall be convenient to the dietary department. These facilities may be shared with adjacent services provided that they are adequately sized.
~~Spaces shall be provided for the exclusive use of the dietary staff. They shall not open directly into the food preparation areas, but must be in close proximity to them.~~

7~~.18.~~.21.B17. Housekeeping rooms. They shall be provided for the exclusive use of the dietary department and shall contain ~~the following:~~ a floor sink and space for mops, pails, and supplies. Where hot water or steam is used for general cleaning, additional space within the room shall be provided for the storage of hoses and nozzles.

7~~.18.~~.21.B18. Ice-making equipment. ~~It~~ This shall be ~~of type that is~~ convenient for service and easily cleaned. It shall be provided for both drinks and food products (self-dispensing equipment)~~,~~ and for general use (storage-bin type equipment).

7~~.18.~~.21.B19. Facilities for ~~C~~commissary or contract services from other areas. ~~Items above may be reduced as appropriate.~~ Provision~~de for~~ shall be made to protect~~ion of~~ food delivered to ~~i~~ensure freshness, ~~retention of~~retain hot and cold, and avoid~~ance of~~ contamination. If delivery is from outside sources, ~~provide~~ protection against weather shall be provided. Provision~~s~~ ~~must~~ shall be made for thorough cleaning and sanitizing of equipment to avoid mixing ~~of~~ soiled and clean equipment.

7~~.18.~~.21.C. Equipment
Mechanical devices shall be heavy duty, suitable for use intended, and easily cleaned. Where equipment is movable, ~~provide~~ heavy-~~-~~duty locking casters shall be provided. If equipment is to have fixed utility connections, the equipment ~~should~~ shall not be equipped with casters. Walk-in coolers, refrigerators, and freezers shall be insulated at floor as well as at walls and top. Coolers and refrigerators shall be capable of maintaining a temperature down to freezing. Freezers shall be capable of maintaining a temperature of 20 degrees below 0~~-~~°F. Coolers, refrigerators, and freezers shall be thermostatically controlled to maintain desired temperature settings in increments of 2 degrees or less. Interior temperatures shall be indicated digitally so as to be visible from the exterior. Controls shall include audible and visible high and low temperature alarm. Time of alarm shall be automatically recorded.

Walk-in units may be lockable from outside but must have release mechanism for exit from inside at all times. Interior shall be lighted. All shelving shall be corrosion resistant, easily cleaned, and constructed and anchored to support a loading of at least 100 pounds per linear foot.

All cooking equipment shall be equipped with automatic shutoff devices to prevent excessive heat buildup.

Under-counter conduits, piping, and drains shall be arranged to not interfere with cleaning ~~of floor below or~~ of the equipment or of the floor below.

7.~~19~~22 Administration and Public Areas

The following shall be provided:

7~~.19.~~.22.A. Entrance
This shall be at grade level, sheltered from inclement weather, and accessible to the disabled.

7~~.19.~~.22.B. Lobby
This shall include:

7~~.19.~~.22.B1. A counter or desk for reception and information.

7~~.19.~~.22.B2. Public waiting area(s).

7~~.19.~~.22.B3. Public toilet facilities.

7~~.19.~~.22.B4. Public telephones.

7~~.19.~~.22.B5. Drinking fountain(s).

7~~.19.~~.22.C. Interview Space(s)
These shall include provisions for private interviews relating to social service, credit, and admissions.

7.~~19.~~22.D. Admissions Area
If required by the functional program for initial admission of inpatients, the area shall include:

7.~~19.~~22.D1. A separate waiting area for patients and accompanying persons.

7.~~19.~~22.D2. A work counter or desk for staff.

7.~~19.~~22.D3. A storage area for wheelchairs, out of the path of normal traffic.

7.~~19.~~22.E. General or Individual Office(s)
These shall be provided for business transactions, medical and financial records, and administrative and professional staff.

7.~~19.~~22.F. Multipurpose Room(s)
These shall be provided for conferences, meetings, and health education purposes, and shall include provisions for the use of visual aids. One multipurpose room may be shared by several services.

7.~~19.~~22.G. Storage for Office Equipment and Supplies

7.22.H. Public Waiting Areas. All public waiting areas serving more than 15 people shall include toilet room(s) equipped with handwashing stations. These toilet rooms shall be located near the waiting areas and may serve more than one such area.

7.~~20~~23 Medical Records

Rooms, areas, or offices for the following personnel and/or functions shall be provided:

7.~~20.~~23.A. Medical Records Administrator/Technician

7.~~20.~~23.B. Review and Dictation

7.~~20.~~23.C. Sorting, Recording, or Microfilming Records

7.~~20.~~23.D. Record Storage

7.~~21~~ 24 Central Services

The following shall be provided:

7.~~21.~~.24.A. Separate Soiled and Clean Work Areas
7.~~21.~~.24.A1. Soiled workroom. This room shall be physically separated from all other areas of the department. Work space ~~should~~ shall be provided to handle the cleaning and initial sterilization/disinfection of all medical/surgical instruments and equipment. Work tables, sinks, flush-type devices, and washer/sterilizer decontaminators shall be provided. Pass-through doors and washer/sterilizer decontaminators ~~should~~ shall deliver into clean processing area/workrooms.

***7.~~21.~~.24.A2.** Clean assembly/workroom. This workroom shall contain handwashing stations, work space, and equipment for terminal sterilizing of medical and surgical equipment and supplies. Clean and

soiled work areas ~~should~~ shall be physically separated.

7~~.21.~~.24.B. Storage Areas

7~~.21.~~.24.B1. Clean/sterile medical/surgical supplies. A room for breakdown ~~should~~ shall be provided for manufacturers' clean/sterile supplies. ~~(~~The clean processing area ~~should~~ shall not be in this area but in an adjacent space~~)~~. Storage for packs, etc., shall include provisions for ventilation, humidity, and temperature control.

7~~.21.~~.24.C. Administrative/Changing Room
If required by the functional program, this room ~~should~~ shall be separate from all other areas and provide for staff to change from street clothes into work attire. Lockers, ~~sink~~handwashing station, and showers ~~should~~ shall be made available within the immediate vicinity of the department.

7~~.21.~~.24.D. Storage Room for Patient Care and Distribution Carts
This area ~~should~~ shall be adjacent~~,~~ and easily available to clean and sterile storage~~,~~ and close to the main distribution point to keep traffic to a minimum and ease ~~of~~ work flow.

7.~~22~~25 General Stores

In addition to supply facilities in individual departments, a central storage area shall ~~also~~ be provided. General stores may be located in a separate building on-site with provisions for protection against inclement weather during transfer of supplies.

The following shall be provided:

7~~.22.~~.25.A. Off-street Unloading Facilities

7~~.22.~~.25.B. Receiving Area
Adequate receiving areas shall be provided to accommodate delivery trucks and other vehicles. Dock areas shall be segregagedfrom other occupied building areas and located so that noise and odors from operation will not adversely affect building occupants. The receiving area shall be convenient to service elevators and other internal corridor systems to promote the safe, secure, and efficient movement of arriving materials without compromising patient areas. Receiving areas shall be segregated from waste staging and other outgoing materials handling functions.

7.25.B1. Adequate space shall be provided to enable breakdown, sorting, and staging of incoming materials and supplies. Balers and other devices shall be located to capture packaging for recycling or return to manufacturer/ deliverer.

7.25.B2. In facilities with centralized warehousing, adequate space shall be provided at receiving points to permit the staging of reusable transport containers for supplies moving from central warehouses to individual receiving sites.

7~~.22.~~.25.C. General Storage Room(s)
General storage room(s) with a total area of not less than 20 square feet (1.86 square meters) per inpatient bed shall be provided. Storage may be in separate, concentrated areas within the institution or in one or more individual buildings on-site. A portion of this storage may be provided off-site.

7~~.22.~~.25.D. Additional Storage Room(s)
Additional storage areas for outpatient facilities shall be provided in an amount not less than 5 percent of the total area of the outpatient facilities. This may be combined with and in addition to the general stores or be located in a central area within the outpatient department. A portion of this storage may be provided off-site.

7.~~23~~26 Linen Services

7~~.23.~~.26.A. General
Each facility shall have provisions for storing and processing of clean and soiled linen for appropriate patient care. Processing may be done within the facility, in a separate building on- or off-site, or in a commercial or shared laundry.

7~~.23.~~.26.B. Internal Processing
Facilities and equipment shall be as required for cost~~--~~-effective operation as described in the functional program. At a minimum, the following elements shall be ~~included~~provided:

7~~.23.~~.26.B1. A separate room for receiving and holding soiled linen until ready for pickup or processing.

7~~.23.~~.26.B2. A central, clean linen storage and issuing room(s), in addition to the linen storage required at individual patient units.

7~~.23.~~.26.B3. Cart storage area(s) for separate parking of clean- and soiled-linen carts out of traffic.

7~~.23.~~.26.B4. A clean linen inspection and mending room or area. If not provided elsewhere, a clean linen inspection, delinting, folding, assembly, and packaging area ~~should~~ shall be provided as part of the linen services. Mending ~~should~~ shall be provided for in the linen services department. A space for tables, shelving, and storage ~~should~~ shall be provided.

7~~.23.~~.26.B5. Handwashing stations in each area where unbagged, soiled linen is handled.

7~~.23.~~.26.C. Outside Processing
If linen is processed outside the building, provisions shall also be made for:

7~~.23.~~.26.C1. A service entrance, protected from inclement weather, for loading and unloading of linen.

7~~.23.~~.26.C2. Control station for pickup and receiving.

7~~.23.~~.26.D. Laundry Facility
If linen is processed in a laundry facility that is part of the project (within or as a separate building), the following shall be provided in addition to ~~that~~ the requirements of Section 7~~.23.~~.26B:

7~~.23.~~.26.D1. A receiving, holding, and sorting room for control and distribution of soiled linen. Discharge from soiled linen chutes ~~may~~ shall be received ~~within this room or~~ in a separate room adjacent to it.

7~~.23.~~.26.D2. Laundry processing room with commercial or industrial~~-~~type equipment that can process at least a seven-day supply within the regular scheduled work week. This may require a capacity for processing a seven-day supply in a 40-hour week.

7~~.23.~~.26.D3. Storage for laundry supplies.

7~~.23.~~.26.D4. Employee handwashing stations in each room where clean or soiled linen is processed and handled.

7~~.23.~~.26.D5. Arrangement of equipment that will permit an orderly work flow and minimize cross-traffic that might mix clean and soiled operations.

7~~.23.~~.26.D6. Conveniently accessible staff lockers, showers, and lounge.

7.~~24~~25 Facilities for Cleaning and Sanitizing Carts

Facilities shall be provided to clean and sanitize carts serving the central service department, dietary facilities, and linen services. These facilities may be centralized or departmentalized.

7.~~25~~28 Employee Facilities

Lockers, lounges, toilets, etc. ~~should~~ shall be provided for employees and volunteers. These ~~should~~ shall be in addition to, and separate from, those required for medical staff and public.

7.~~26~~ 29 Housekeeping Rooms

In addition to the housekeeping rooms required in certain departments, sufficient housekeeping rooms shall be provided throughout the facility ~~as required~~ to maintain a clean and sanitary environment. Each shall contain a floor receptor or service sink and storage space for housekeeping equipment and supplies. There shall not be less than one housekeeping room for each floor.

7.~~27~~30 Engineering Service and Equipment Areas

Sufficient space shall be included in all mechanical and electrical equipment rooms for proper maintenance of equipment. Provisions shall also be made for removal and replacement of equipment. The following shall be provided:

7~~.27.~~.30.A.
Room(s) or separate building(s) for boilers, mechanical, and electrical equipment, *except*:

7~~.27.~~.30.A1. Roof-top air conditioning and ventilation equipment installed in weatherproof housings.

7~~.27.~~.30.A2. Standby generators where the engine and appropriate accessories (i.e., batteries) are properly heated and enclosed in a weatherproof housing.

7~~.27.~~.30.A3. Cooling towers and heat rejection equipment.

7~~.27.~~.30.A4. Electrical transformers and switchgear where required to serve the facility and where installed in a weatherproof housing.

7~~.27.~~.30.A5. Medical gas parks and equipment.

7~~.27.~~.30.A6. Air-cooled chillers where installed in a weatherproof housing.

7~~.27.~~.30.A7. Trash compactors and incinerators.

7.30.A8. Site lighting, post indicator valves, and other equipment normally installed on the exterior of the building.

7.30.A9. Where required in new construction, fire pumps and ancillary equipment shall be separated from other functions by construction having a 2-hour fire resistance rating. The fire pump shall be installed in a readily accessible location with direct access from the exterior.

7~~.27.~~.30.B.
Engineer's office with file space and provisions for protected storage of facility drawings, records, manuals, etc.

7~~.27.~~.30.C.
General maintenance shop(s) for repair and maintenance.

7~~.27.~~.30.D.
Storage room for building maintenance supplies. Storage for solvents and flammable liquids shall comply with applicable NFPA codes.

7~~.27.~~.30.E.
Separate area or room specifically for storage, repair, and testing of electronic and other medical equipment. The amount of space and type of utilities will vary with the type of equipment involved and types of outside contracts used.

7~~.27.~~.30.F.
Yard equipment and supply storage areas~~, shall be~~ located so that equipment may be moved directly to the exterior without interference with other work.

7.~~28~~31 General Standards for Details and Finishes

If approved by the authorities having jurisdiction, retained portions of existing facilities that are not required to be totally modernized due to financial or other hardships may, as a minimum, comply with applicable requirements of the Existing Health Care Occupancies Section of NFPA 101. However, a plan of correction for these portions should also be developed and implemented.

Details and finishes in new construction projects, including additions and alterations, shall comply with the following (see Section 1.2 concerning existing facilities where total compliance is structurally impractical):

7~~.28.~~.31.A. Details

7~~.28.~~.31.A1. Compartmentation, exits, fire alarms, automatic extinguishing systems, and other fire prevention and fire protection measures, including those within existing facilities, shall comply with NFPA 101, with the following stipulation. The Fire-Safety Evaluation System (FSES) is permitted, subject to AHJ approval, in new construction and renovation~~shall not be used as a substitute for basic NFPA 101 design criteria for new construction or major renovations in existing facilities~~. (The FSES is intended as an evaluation tool for fire safety only.) See Section 1.6 for exceptions.

Note: For most projects it is essential that third-party reimbursement requirements also be followed. Verify where these may be in excess of standards in these Guidelines.

7~~.28.~~.31.A2. Corridors in outpatient suites and in areas not commonly used for patient bed or stretcher transportation may be reduced in width to 5 feet (1.52 meters).

7~~.28.~~.31.A3. Location of items such as drinking fountains, telephone booths, vending machines, and portable equipment shall not restrict corridor traffic or reduce the corridor width below the minimum standard.

7~~.28.~~.31.A4. Rooms that contain bathtubs, sitz baths, showers, and/or water closets for inpatient use shall be equipped with doors and hardware permitting emergency access from the outside. When such rooms have only one opening or are small, the doors shall open outward or in a manner that will avoid pressing a patient who may have collapsed within the room. Similar considerations may be desirable for certain outpatient services.

7~~.28.~~.31.A5. If required by the functional program, door hardware on patient toilet rooms in psychiatric nursing units may be designed to allow staff to control access.

7~~.28.~~.31.A6. The minimum door size for inpatient bedrooms in new work shall be 3 feet 8 inches (1.11 meters) wide and 7 feet (2.13 meters) high to provide clearance for movement of beds and other equipment. Existing doors of not less than 2 feet 10 inches (863.6 millimeters) wide may be considered for acceptance where function is not adversely affected and replacement is impractical. Doors to other rooms used for stretchers (including hospital wheeled-bed stretchers) and/or wheelchairs shall have a minimum width of 2 feet 10 inches (863.6 millimeters). Where used in these Guidelines, door width and height shall be the nominal dimension of the door leaf, ignoring projections of frame and stops. **Note**: While these standards are intended for access by patients and patient equipment, size of office furniture, etc., shall also be considered.

7~~.28.~~.31.A7. All doors between corridors, rooms, or spaces subject to occupancy, except elevator doors, shall be of the swing type. Manual or automatic sliding doors may be exempt from this standard where fire and other emergency exiting requirements are not compromised and where cleanliness of surfaces can be maintained.

7~~.28.~~.31.A8. Doors, except those to spaces such as small closets not subject to occupancy, shall not swing into corridors in a manner that might obstruct traffic flow or reduce the required corridor width. (Large walk-in-type closets are considered inhabitable spaces.)

7~~.28.~~.31.A9. Windows and outer doors that frequently may be left open shall be equipped with insect screens.

7~~.28.~~.31.A10. Operable windows are not required in patient rooms. If operable windows are provided in patient rooms or suites, operation of such windows shall be restricted to inhibit possible escape or suicide.

7~~.28.~~.31.A11. Glass doors, lights, sidelights, borrowed lights, and windows located within 12 inches (304.8 millimeters) of a door jamb (with a bottom-frame height of less than 60 inches or 1.52 meters above the finished floor) shall be constructed of safety glass, wired glass, or plastic, break-resistant material that creates no dangerous cutting edges when broken. Similar materials shall be used for wall

openings in active areas such as recreation and exercise rooms, unless otherwise required for fire safety. Safety glass-tempered or plastic glazing materials shall be used for shower doors and bath enclosures. Plastic and similar materials used for glazing shall comply with the flame-spread ratings of NFPA 101. Safety glass or plastic glazing materials, as noted above, shall also be used for interior windows and doors, including those in pediatric and psychiatric unit corridors. In renovation projects, only glazing within 18 inches (460 millimeters) of the floor must be changed to safety glass, wire glass, or plastic, break-resistant material.

Note: Provisions of this paragraph concern safety from hazards of breakage. NFPA 101 contains additional requirements for glazing in exit corridors, etc., especially in buildings without sprinkler systems.

7~~.28.~~.31.A12. Linen and refuse chutes shall meet or exceed the following standards:

a. Service openings to chutes shall comply with NFPA 101.

b. The minimum cross-sectional dimension of gravity chutes shall be 2 feet (609.6 millimeters).

c. Chute discharge into collection rooms shall comply with NFPA 101.

d. Chutes shall meet the provisions as described in NFPA 82.

7~~.28.~~.31.A13. Thresholds and expansion joint covers shall be flush with the floor surface to facilitate the use of wheelchairs and carts. Expansion and seismic joints shall be constructed to restrict the passage of smoke.

7~~.28.~~.31.A14. Grab bars shall be provided in all patient toilets, showers, bathtubs, and sitz baths at a wall clearance of 1-1/2 inches (38.1 millimeters). Bars, including those that are part of such fixtures as soap dishes, shall be sufficiently anchored to sustain a concentrated load of 250 pounds (113.4 kilograms).

7~~.28.~~.31.A15. Location and arrangement of fittings for handwashing stations shall permit their proper use and operation. Particular care ~~should~~ shall be given to the clearances required for blade-type operating handles.

7~~.28.~~.31.A16. Mirrors shall not be installed at handwashing stations in food preparation areas, nurseries, clean and sterile supply areas, scrub sinks, or other areas where asepsis control would be lessened by hair combing.

7~~.28.~~.31.A17. Provisions for hand drying shall be included at all handwashing stations except scrub sinks. These provisions shall be paper or cloth units enclosed to protect against dust or soil and to ~~i~~ensure single-unit dispensing. Hot air dryers are permitted provided that installation precludes possible contamination by recirculation of air.

7~~.28.~~.31.A18. Lavatories and handwashing stations shall be securely anchored to withstand an applied vertical load of not less than 250 pounds (113.4 kilograms) on the fixture front.

7~~.28.~~.31.A19. Radiation protection requirements for x-ray and gamma ray installations shall conform with NCRP Report Nos. 33 and 49 and all applicable local requirements. Provision shall be made for testing completed installations before use. All defects must be corrected before approval. Testing is to be

coordinated with local authorities to prevent duplication.

7~~.28.~~.31.A20. The minimum ceiling height shall be 7 feet 10 inches (2.39 meters), with the following exceptions:

a. Boiler rooms shall have ceiling clearances not less than 2 feet 6 inches (762 millimeters) above the main boiler header and connecting piping.

b. Ceilings in radiographic, operating, and delivery rooms, and other rooms containing ceiling-mounted equipment or ceiling-mounted surgical light fixtures, shall be of sufficient height to accommodate the equipment or fixtures and their normal movement.

c. Ceilings in corridors, storage rooms, and toilet rooms shall be not less than 7 feet 8 inches (2.34 meters) in height. Ceiling heights in small, normally unoccupied spaces may be reduced.

d. Suspended tracks, rails, and pipes located in the traffic path for patients in beds and/or on stretchers, including those in inpatient service areas, shall be not less than 7 feet (2.13 meters) above the floor. Clearances in other areas may be 6 feet 8 inches (2.03 meters).

e. Where existing structures make the above ceiling clearance impractical, clearances shall be as required to avoid injury to individuals up to 6 feet 4 inches (1.93 meters) tall.

f. Seclusion treatment rooms shall have a minimum ceiling height of 9 feet (2.74 meters).

7~~.28.~~.31.A21. Recreation rooms, exercise rooms, equipment rooms, and similar spaces where impact noises may be generated shall not be located directly over patient bed areas or delivery and operating suites, unless special provisions are made to minimize such noise.

7~~.28.~~.31.A22. Rooms containing heat-producing equipment, such as boiler or heater rooms or laundries, shall be insulated and ventilated to prevent the floor surface above and/or the adjacent walls of occupied areas from exceeding a temperature of 10°F (6°C) above ambient room temperature.

7~~.28.~~.31.A23. The noise reduction criteria shown in Table 7.1 shall apply to partitions, floors, and ceiling construction in patient areas.

7~~.28.~~.31.B. Finishes

7~~.28.~~.31.B1. Cubicle curtains and draperies shall be noncombustible or flame-retardant, and shall pass both the large- and small-scale tests of NFPA 701 when applicable.

7~~.28.~~.31.B2. Materials and certain plastics known to produce noxious gases when burned shall not be used for mattresses, upholstery, and other items insofar as practical. ~~(Typical "hard" floor coverings such as vinyl, vinyl composition, and rubber normally do not create a major fire or smoke problem.)~~

7~~.28.~~.31.B3. Floors in areas and rooms in which flammable anesthetic agents are stored or administered shall comply with NFPA 99.

7~~.28.~~.31.B4. Floor materials shall be easily cleanable and appropriately wear-resistant for the location. Floors in areas used for food preparation or food assembly shall be water-resistant. Floor surfaces,

including tile joints, shall be resistant to food acids. In all areas subject to frequent wet-cleaning methods, floor materials shall not be physically affected by germicidal cleaning solutions. Floors subject to traffic while wet (such as shower and bath areas, kitchens, and similar work areas) shall have a nonslip surface.

7~~.28.~~.31.B5. In new construction or major renovation work, the floors and wall bases of all operating rooms and any delivery rooms used for cesarean sections shall be monolithic and joint free. The floors and wall bases of kitchens, soiled workrooms, and other areas subject to frequent wet cleaning shall also be homogenous, but may have tightly sealed joints.

7~~.28.~~.31.B6. Wall finishes shall be washable. In the vicinity of plumbing fixtures, wall finishes shall be smooth and water-resistant.

In dietary and food preparation areas, wall construction, finish, and trim, including the joints between the walls and the floors, shall be free of insect- and rodent-harboring spaces.

In operating rooms, delivery rooms for cesarean sections, isolation rooms, and sterile processing rooms, wall finishes shall be free of fissures, open joints, or crevices that may retain or permit passage of dirt particles.

7~~.28.~~.31.B7. Floors and walls penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of rodents and insects. Joints of structural elements shall be similarly sealed.

7~~.28.~~.31.B8. Ceilings, including exposed structure in areas normally occupied by patients or staff in food preparation and food storage areas, shall be cleanable with routine housekeeping equipment. Acoustic and lay-in ceiling, where used, shall not interfere with infection control.

In dietary areas and in other areas where dust fallout may present a problem, ~~provide~~ suspended ceilings shall be provided.

Ceiling finishes in ~~semi~~restricted areas such as operating rooms (subject to documented review and acceptance of the hospital's medical and infection control staff) and semirestricted areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms, and minor surgical procedure rooms ~~must~~ shall be smooth, scrubbable, nonabsorptive, nonperforated, capable of withstanding cleaning with chemicals, and without crevices that can harbor mold and bacterial growth. If lay-in ceiling is provided, it shall be gasketed or clipped down to prevent the passage of particles from the cavity above the ceiling plane into the semirestricted environment. Perforated, tegular, serrated cut, or highly textured tiles are not acceptable.

~~Ceiling finishes in restricted areas such as operating rooms shall be monolithic, scrubbable, and capable of withstanding chemicals. Cracks or perforations in these ceilings are not allowed.~~

In psychiatric patient rooms, toilets, and seclusion rooms, the ceiling and air distribution devices, lighting fixtures, sprinkler heads, and other appurtenances shall be of a tamper-resistant type.

7~~.28.~~.31.B9. Rooms used for protective isolation and anterooms adjacent to rooms used for protective isolation shall ~~not~~ have seamless flooring with integral coved base~~carpeted floors and shall have monolithic ceilings~~.

7.~~29~~ 32 Design and Construction, Including Fire -Resistant Standards

7.~~29.~~32.A. Design
Every building and portion thereof shall be designed and constructed to sustain all live and dead loads, including seismic and other environmental forces, in accordance with accepted engineering practices and standards as prescribed by local jurisdiction or by one of the model building codes. (See Section 1.1.A.)

7.~~29.~~32.B. Construction
Construction shall comply with the applicable requirements of NFPA 101, the standards contained herein, and the requirements of authorities having jurisdiction. If there are no applicable local codes, one of the recognized model building codes shall be used (see Section 1.6).

Note: NFPA 101 generally covers fire/safety requirements only, whereas most model codes also apply to structural elements. The fire/safety items of NFPA 101 would take precedence over other codes in case of conflict. Appropriate application of each would minimize problems. For example, some model codes require closers on all patient doors. NFPA 101 recognizes the potential fire/safety problems of this requirement and stipulates that if closers are used for patient room doors, smoke detectors should also be provided within each affected patient room.

7.~~29.~~32.C. Freestanding Buildings
Separate freestanding buildings for the boiler plant, laundry, shops, general storage, or other nonpatient contact areas shall be built in accordance with applicable building codes for such occupancy.

7.~~29.~~32.D. Interior Finishes
Interior finishing materials shall comply with the flame-spread limitations and the smoke-production limitations indicated in NFPA 101. This requirement does not apply to minor quantities of wood or other trim (see NFPA 101) or to wall covering less than ~~four~~ 4 mil thick applied over a noncombustible base.

7.~~29.~~32.E. Insulation Materials
Building insulation materials, unless sealed on all sides and edges with noncombustible material, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 150 or less when tested in accordance with NFPA 255.

7.~~29.~~32.F. Provisions for Disasters
~~(~~See also Section 1.~~-~~5.~~)~~

7.~~29.~~32.F1. An emergency-radio communication system shall be provided in each facility. This system shall operate independently of the building's service and emergency power systems during emergencies. The system shall have frequency capabilities to communicate with state emergency communication networks. Additional communication capabilities ~~will be~~are required of facilities containing a formal community emergency-trauma service or other specialty services (such as regional pediatric critical care units) that utilize staffed patient transport units.

7.~~29.~~32.F2. Unless specifically approved, hospitals shall not be built in areas subject to damage or inaccessibility due to natural floods. Where facilities may be subject to wind or water hazards, provision shall be made to ensure continuous operation.

7.~~30~~ 33 Special Systems

7.~~30.~~33.A. General

7~~.30.~~.33.A1. Prior to acceptance of the facility, all special systems shall be tested and operated to demonstrate to the owner or his designated representative that the installation and performance of these systems conform to design intent. Test results shall be documented for maintenance files.

7~~.30.~~.33.A2. Upon completion of the special systems equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions, a parts lists, and complete procurement information including equipment numbers and descriptions. Operating staff persons shall also be provided with instructions for proper operation of systems and equipment. Required information shall include all safety or code ratings as needed.

7~~.30.~~.33.A3. Insulation shall be provided surrounding special system equipment to conserve energy, protect personnel, and reduce noise.

7~~.30.~~.33.B. Elevators

All hospitals having patient facilities (such as bedrooms, dining rooms, or recreation areas) or critical services (such as operating, delivery, diagnostic, or therapeutic) located on other than the grade-level entrance floor shall have electric or hydraulic elevators. Installation and testing of elevators shall comply with ANSI/ASME A17.1 for new construction and ANSI/ASME A17.3 for existing facilities. (See ASCE 7-93 for seismic design and control systems requirements for elevators.)

7~~.30.~~.33.B1. In the absence of an engineered traffic study, the following guidelines for number of elevators shall apply:

a. At least ~~one~~ two hospital-type elevators shall be installed ~~when~~ where 1 to 59 patient beds are located on any floor other than the main entrance floor.

b. At least two hospital-type elevators shall be installed ~~when~~ where 60 to 200 patient beds are located on floors other than the main entrance floor, or where the major inpatient services are located on a floor other than those containing patient beds. (Elevator service may be reduced for those floors providing only partial inpatient services.)

c. At least three hospital-type elevators shall be installed where 201 to 350 patient beds are located on floors other than the main entrance floor, or where the major inpatient services are located on a floor other than those containing patient beds. (Elevator service may be reduced for those floors that provide only partial inpatient services.)

d. For hospitals with more than 350 beds, the number of elevators shall be determined from a study of the hospital plan and the expected vertical transportation requirements.

***7~~.30.~~.33.B2.** Hospital-type elevator cars shall have inside dimensions that accommodate a patient bed with attendants. Cars shall be at least 5 feet 8 inches (1.73 meters) wide by 9 feet (2.74 meters) deep. Car doors shall have a clear opening of not less than 4 feet (1.22 meters) wide and 7 feet (2.13 meters) high. In renovations, existing elevators that can accommodate patient beds used in the facility will not be required to be increased in size.

Note: Additional elevators installed for visitors and material handling may be smaller than noted above, within restrictions set by standards for disabled access.

7~~.30.~~.33.B3. Elevators shall be equipped with a two-way automatic level-maintaining device with an accuracy of ± 1/4 inch (± 6.4 millimeters).

7~~.30.~~.33.B4. Each elevator, except those for material handling, shall be equipped with an independent keyed switch for staff use for bypassing all landing button calls and responding to car button calls only.

7~~.30.~~.33.B5. Elevator call buttons and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors. This is so that the light control feature will be overridden or disengaged should it encounter smoke at any landing.

7~~.30.~~.33.B6. Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this section as well as all applicable safety regulations and codes.

7~~.30.~~.33.C. Waste ~~Processing Services~~Management

~~**7.30.C1.** Storage and disposal. Facilities shall be provided for sanitary storage and treatment or disposal of waste using techniques acceptable to the appropriate health and environmental authorities. The functional program shall stipulate the categories and volumes of waste for disposal and shall stipulate the methods of disposal for each.~~

~~**7.30.C2.** Medical waste. Medical waste shall be disposed of either by incineration or other approved technologies. Incinerators or other major disposal equipment may be shared by two or more institutions.~~

~~a. Incinerators or other major disposal equipment may also be used to dispose of other medical waste where local regulations permit. Equipment shall be designed for the actual quantity and type of waste to be destroyed and should meet all applicable regulations.~~

~~b. Incinerators with 50 pounds per hour or greater capacities shall be in a separate room or outdoors; those with lesser capacities may be located in a separate area within the facility boiler room. Rooms and areas containing incinerators shall have adequate space and facilities for incinerator charging and cleaning, as well as necessary clearances for work and maintenance. Provisions shall be made for operation, temporary storage, and disposal of materials so that odors and fumes do not drift back into occupied areas. Existing approved incinerator installations, which are not in separate rooms or outdoors, may remain unchanged provided they meet the above criteria.~~

~~c. The design and construction of incinerators and trash chutes shall comply with NFPA 82.~~

~~*d. Heat recovery.~~

~~*e. Environmental guidelines.~~

***7.33.C1.** Collection and storage. Waste collection and storage locations shall be determined by the facility as a component of the functional program. The functional program shall stipulate the categories and volumes of waste for disposal and the methods of handling and disposal of waste. The functional program shall outline the space requirements, including centralized waste collection and storage spaces. Size of spaces shall be determined based upon volume of projected waste and length of anticipated storage.

a. At docks or other waste removal areas, the functional program shall stipulate the location of compactors, balers, sharps, and recycling container staging. Red bag waste shall be staged in enclosed and secured areas. Biohazardous and environmentally hazardous materials, including mercury, nuclear reagent waste, and other regulated waste types, shall be segregated and secured.

b. If provided, regulated medical waste or infectious waste storage spaces shall have a floor drain, cleanable floor and wall surfaces, lighting, and exhaust ventilation, and should be safe from weather, animals and unauthorized entry. Refrigeration requirements for such storage facilities shall comply with state and/or local regulations.

7.33.C2 Waste treatment and disposal technologies

*a. On-site hospital incinerators shall comply with federal, state, and local regulatory and environmental requirements. The design and construction of incinerators and trash chutes shall comply with NFPA 82.

*b. Types of non-incineration waste treatment technology(ies) shall be determined by the facility in conjunction with environmental, economic, and regulatory considerations. The functional program shall describe waste treatment technology components.

(1) In determining the location for a non-incineration technology, safe transfer routes, distances from waste sources, temporary storage requirements, as well as space requirements for treatment equipment shall be considered. The location of the technology shall not cause traffic problems as waste is brought in and out. Odor, noise, and the visual impact of medical waste operations on patients, visitors, public access and security shall be considered.

(2) Space requirements for such technologies shall be determined by the equipment requirements, including associated area for opening waste entry doors, access to control panels, space for hydraulic lifts, conveyors, and operational clearances. Mobile or portable units, trailer-mounted units, underground installations, or all-weather enclosed shelters at an outdoor site may also be used, subject to local regulatory approvals.

(3) Exhaust vents, if any, from the treatment technology shall be located a minimum of 75 feet (22.86 meters) from inlets to HVAC systems. If the technology involves heat dissipation, sufficient cooling and ventilation shall be provided.

7.~~30.~~.33.C3. Nuclear waste disposal. See *Code of Federal Regulations*, title X, parts 20 and 35, concerning the handling and disposal of nuclear materials in health care facilities.

7.~~31~~ 34 Mechanical Standards

7.~~31.~~.34.A. General

*__7.~~31.~~.34.A1.__ The mechanical system should be designed for overall efficiency and appropriate life-cycle cost. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually. Recognized engineering procedures shall be followed for the most economical and effective results. A well-designed system can generally achieve energy efficiency at minimal additional cost and simultaneously provide improved patient comfort. Different geographic areas may have climatic and use conditions that favor one system over another in terms of overall cost and

efficiency. In no case shall patient care or safety be sacrificed for conservation.

~~Mechanical, electrical, and HVAC equipment may be located either internally, externally, or in separate buildings.~~

~~**7.31.A2.** Remodeling and work in existing facilities may present special problems. As practicality and funding permit, existing insulation, weather stripping, etc., should be brought up to standard for maximum economy and efficiency. Consideration shall be given to additional work that may be needed to achieve this.~~

7~~.31.~~.34.A~~3~~2. Facility design consideration shall include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.

7~~.31.~~.34.A~~4~~3. Insofar as practical, the facility ~~should~~ shall include provisions for recovery of waste cooling and heating energy (ventilation, exhaust, water and steam discharge, cooling towers, incinerators, etc.).

***7~~.31.~~.34.A~~5~~4.** Facility design consideration shall include recognized energy-saving mechanisms such as variable-air-volume (VAV) systems, load shedding, programmed controls for unoccupied periods (nights and weekends, etc.), and use of natural ventilation, site and climatic conditions permitting. ~~Systems with excessive installation and/or maintenance costs that negate long-range energy savings should be avoided.~~

7~~.31.~~.34.A~~6~~5. Air-handling systems shall be designed with an economizer cycle where appropriate to use outside air. (Use of mechanically circulated outside air does not reduce need for filtration.)

It may be practical in many areas to reduce or shut down mechanical ventilation ~~during~~ under appropriate climatic and patient-care conditions and to use open windows for ventilation.

7~~.31.~~.34.A~~7~~6. Mechanical equipment, ductwork, and piping shall be mounted on vibration isolators as required to prevent unacceptable structure-borne vibration.

7~~.31.~~.34.A~~8~~7. Supply and return mains and risers for cooling, heating, and steam systems shall be equipped with valves to isolate the various sections of each system. Each piece of equipment shall have valves at the supply and return ends.

7.34.A8. Filter housing blank-off panels shall be permanently attached to the frame, constructed of rigid materials, and have sealing surfaces equal to or greater than the filter media installed in the filter frame.

7.34.A9. Upon completion of the equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions, parts lists, and complete procurement information, including equipment numbers and descriptions. Operating staff persons shall also be provided with instructions for properly operating systems and equipment. Required information shall include energy ratings as needed for future conservation calculations.

7~~.31.~~.34.B. Thermal and Acoustical Insulation

7~~.31.~~.34.B1. Insulation shall be provided within the building ~~shall be provided~~ to conserve energy, protect personnel, prevent vapor condensation, and reduce noise.

7~~.31.~~.34.B2. Insulation on cold surfaces shall include an exterior vapor barrier. (Material that will not absorb or transmit moisture will not require a separate vapor barrier.)

7~~.31.~~.34.B3. Insulation, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less as determined by an independent testing laboratory in accordance with NFPA 255.

7~~.31.~~.34.B4. If duct lining is used, it shall be coated and sealed, and shall meet ASTM C1071. These linings (including coatings, adhesives, and exterior surface insulation on pipes and ducts in spaces used as air supply plenums) shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as determined by an independent testing laboratory in accordance with NFPA 255. If existing lined ductwork is reworked in a renovation project, the liner seams and punctures shall be resealed.

7~~.31.~~.34.B5. Duct linings exposed to air movement shall not be used in ducts serving operating rooms, delivery rooms, LDR rooms, nurseries, protective environment rooms, and critical care units. This requirement shall not apply to mixing boxes and acoustical traps that have special coverings over such lining.

7~~.31.~~.34.B6. Existing accessible insulation within areas of facilities to be modernized shall be inspected, repaired, and/or replaced, as appropriate.

7~~.31.~~.34.B7. Duct lining shall not be installed within 15 feet (4.57 meters) downstream of humidifiers.

7.34.B8. All return ventilation shall be via ducted systems in patient care areas.

7~~.31.~~.34.C. Steam and Hot Water Systems

~~**7.31.C1.** Boilers shall have the capacity, based upon the net ratings published by the Hydronics Institute or another acceptable national standard, to supply the normal heating, hot water, and steam requirements of all systems and equipment. Their number and arrangement shall accommodate facility needs despite the breakdown or routine maintenance of any one boiler. The capacity of the remaining boiler(s) shall be sufficient to provide hot water service for clinical, dietary, and patient use; steam for sterilization and dietary purposes; and heating for operating, delivery, birthing, labor, recovery, intensive care, nursery, and general patient rooms.~~

7.34.C1. Boilers shall have the capacity, based upon the net ratings published by the Hydronics Institute or another acceptable national standard, to supply the normal heating, hot water, and steam requirements of all systems and equipment. Their number and arrangement shall accommodate facility needs despite the breakdown or routine maintenance of any one boiler. The capacity of the remaining boiler(s) shall be sufficient to provide hot water service for clinical, dietary, and patient use; steam for sterilization and dietary purposes; and heating for operating, delivery and birthing, labor, recovery, and intensive care. However, reserve capacity for facility space heating is not required in geographic areas where a design dry-bulb temperature of 25°F (-4°C) or more represents not less than 99 percent of the total hours in any one heating month as noted in ASHRAE's *Handbook of Fundamentals*, under the "Table for Climatic Conditions for the United States."

7~~.31.~~.34.C2. Boiler accessories, including feed pumps, heat-circulating pumps, condensate return pumps, fuel oil pumps, and waste heat boilers, shall be connected and installed to provide both normal and standby service.

***7.~~31.~~.34.D. ~~Air Conditioning,~~ Heating, ~~and~~ Ventilation, and Air Conditioning (HVAC) Systems**

***7.~~31.~~.34.D1.** All rooms and areas ~~in the facility~~ used for patient care shall have provisions for ventilation. The ventilation rates shown in Table 7.2 shall be used only as minimum standards; they do not preclude the use of higher, more appropriate rates. Alt~~T~~hough natural window ventilation for nonsensitive areas and patient rooms ~~may be employed~~is permitted, ~~weather permitting, availability of~~ mechanical ventilation ~~should~~ shall be considered for use in interior areas and during periods of temperature extremes. Fans serving exhaust systems shall be located at the discharge end and shall be readily serviceable. Air supply and exhaust in rooms for which no minimum total air change rate is noted may vary down to zero in response to room load. For rooms listed in Table 7.2, where VAV systems are used, minimum total air change shall be within limits noted. ~~Temperature control shall also comply with these standards.~~ Space temperature and relative humidity shall be as indicated in Table 7.2. To maintain asepsis control, airflow supply and exhaust ~~should~~ shall generally be controlled to ensure movement of air from "clean" to "less clean" areas, especially in critical areas. The ventilation systems shall be designed and balanced according to the requirements shown in Table 7.2 and in the applicable notes.

For renovation projects, prior to the start of construction and preferably during design, airflow and static pressure measurements shall be taken at the connection points of new ductwork to existing systems. This information shall be used by the designer to determine if existing systems have sufficient capacity for intended new purposes, and so any required modifications to the existing system can be included in the design documentation.

7.~~31.~~.34.D2. Exhaust systems may be combined to enhance the efficiency of recovery devices required for energy conservation. Local exhaust systems shall be used whenever possible in place of dilution ventilation to reduce exposure to hazardous gases, vapors, fumes, or mists. Airborne infection isolation rooms shall not be served by exhaust systems incorporating a heat wheel.

Exhaust outlets from areas that may be contaminated shall be above roof level and arranged to minimize recirculation of exhaust air into the building. The requirement for a 25-foot (7.62-meter) separation also pertains to the distance between the intake and the exhaust and/or gas vent off of packaged rooftop units.

***7.~~31.~~.34.D3.** Fresh air intakes shall be located at least 25 feet (7.62 meters) from exhaust outlets of ventilating systems, combustion equipment stacks, medical-surgical vacuum systems, plumbing vents, or areas that may collect vehicular exhaust or other noxious fumes. (Prevailing winds and/or proximity to other structures may require greater clearances.) Plumbing and vacuum vents that terminate at a level above the top of the air intake may be located as close as 10 feet (3.05 meters). The bottom of outdoor air intakes serving central systems shall be as high as practical, but at least 6 feet (1.83 meters) above ground level, or, if installed above the roof, 3 feet (0.91 meter) above roof level. ~~Exhaust outlets from areas that may be contaminated shall be above roof level and arranged to minimize recirculation of exhaust air into the building. The requirement for a 25-foot (7.62-meter) separation also pertains to the distance between the intake and the exhaust and/or gas vent off of packaged rooftop units.~~

***7.~~31.~~.34.D4.** In new construction and major renovation work, air supply for operating and delivery rooms shall be from non-aspirating diffusers with a face velocity in the range of 25 to 35 fpm (0.13 to 0.18 m/s), located ~~ceiling outlets~~ near the center of the work area. Return air shall be near the floor level, at a minimum. Return air shall be permitted high on the walls, in addition to the low returns. Each operating and delivery room shall have at least two return-air inlets located as ~~remotely~~ far from each other as practical. ~~(Design should consider t~~Turbulence and other factors of air movement shall be considered to minimize the fall of particulates onto sterile surfaces.~~)~~ Temperature shall be individually

controlled for each operating and delivery room. During unoccupied hours, operating room air change rates may be reduced, provided that the positive room pressure is maintained as required in Table 7.2. Operating room ventilation systems shall operate at all times, except during maintenance and conditions requiring shutdown by the building's fire alarm system. Where extraordinary procedures, such as organ transplants, justify special designs, installation shall properly meet performance needs as determined by applicable standards. These special designs should be reviewed on a case-by-case basis. ~~Temperature shall be individually controlled for each operating and delivery room.~~

7~~.31.~~.34.D5. ~~Air supply for rooms used for invasive procedures shall be at or near the ceiling. Return or exhaust air inlets shall be near the floor level. Exhaust grills for anesthesia evacuation and other special applications shall be permitted to be installed in the ceiling.~~ When anesthesia scavenging systems are required by Section 7.34.D6, air supply shall be at or near the ceiling. Return or exhaust air inlets shall be near the floor level.

***7~~.31.~~.34.D6.** Each space routinely used for administering inhalation anesthesia and inhalation analgesia shall be served by a scavenging system to vent waste gases. If a vacuum system is used, the gas-collecting system shall be arranged so that it does not disturb patients' respiratory systems. Gases from the scavenging system shall be exhausted directly to the outside. The anesthesia evacuation system may be combined with the room exhaust system, provided that the part used for anesthesia gas scavenging exhausts directly to the outside and is not part of the recirculation system. Scavenging systems are not required for areas where gases are used only occasionally, such as the emergency department, offices for routine dental work, etc. Acceptable concentrations of anesthetizing agents are unknown at this time. The absence of specific data makes it difficult to set specific standards. However, any scavenging system should be designed to remove as much of the gas as possible from the room environment. It is assumed that anesthetizing equipment will be selected and maintained to minimize leakage and contamination of room air.

7~~.31.~~.34.D7. The bottoms of ventilation (supply/return) openings shall be at least 3 inches (76.2 millimeters) above the floor.

7~~.31.~~.34.D8. All central ventilation or air conditioning systems shall be equipped with filters with efficiencies equal to, or greater than, those specified in Table 7.3. Where two filter beds are required, filter bed no. 1 shall be located upstream of the air conditioning equipment and filter bed no. 2 shall be downstream of any fan or blowers. Filter efficiencies, tested in accordance with ASHRAE 52.1-1992, shall be average. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing duct work. All joints between filter segments and enclosing duct~~-~~work shall have gaskets or seals to provide a positive seal against air leakage. A manometer shall be installed across each filter bed having a required efficiency of 75 percent or more, including hoods requiring HEPA filters. Provisions shall be made to allow access for field testing.

***7~~.31.~~.34.D9.** If duct humidifiers are located upstream of the final filters, they shall be at least 15 feet (4.57 meters) upstream of the final filters. Ductwork with duct-mounted humidifiers shall have a means of water removal. An adjustable high-limit humidistat shall be located downstream of the humidifier to reduce the potential for condensation inside the duct. Humidifiers shall be connected to airflow proving switches that prevent humidification unless the required volume of airflow is present or high-limit humidistats are provided. All duct takeoffs ~~should~~shall be sufficiently downstream of the humidifier to ensure complete moisture absorption. Steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.
~~If duct humidifiers are located upstream of the final filters, they shall be located at least 15 feet (4.57~~

~~meters) upstream of the final filters. Ductwork with duct mounted humidifiers shall have a means of water removal. An adjustable high limit humidistat shall be located downstream of the humidifier to reduce the potential of condensation inside the duct. All duct takeoffs should be sufficiently downstream of the humidifier to ensure complete moisture absorption. Steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.~~

7~~.31.~~.34.D10. Air-handling duct systems shall be designed with accessibility for duct cleaning, and shall meet the requirements of NFPA 90A.

7~~.31.~~.34.D11. Ducts that penetrate construction intended to protect against x-ray, magnetic, RFI, or other radiation shall not impair the effectiveness of the protection.

7~~.31.~~.34.D12. Fire and smoke dampers shall be constructed, located, and installed in accordance with the requirements of NFPA 101, 90A, and the specific damper's listing requirements. Fans, dampers, and detectors shall be interconnected so that damper activation will not damage ducts. Maintenance access shall be provided at all dampers. All damper locations ~~should~~ shall be shown on design drawings. Dampers ~~should~~ shall be activated in accordance with NFPA 90A ~~by fire or smoke sensors, not by fan cutoff alone~~. Switching systems for restarting fans may be installed for fire department use in venting smoke after a fire has been controlled. However, provisions should be made to avoid possible damage to the system due to closed dampers. When smoke partitions are required, heating, ventilation, and air conditioning zones shall be coordinated with compartmentation insofar as practical to minimize need to penetrate fire and smoke partitions.

7~~.31.~~.34.D13. Hoods and safety cabinets may be used for normal exhaust of a space providing minimum air change rates are maintained. If air change standards in Table 7.2 do not provide sufficient air for proper operation of exhaust hoods and safety cabinets (when in use), supplementary makeup air (filtered and preheated) shall be provided around these units to maintain the required airflow direction and exhaust velocity. Use of makeup air will avoid dependence upon infiltration from outdoor and/or from contaminated areas. Makeup systems for hoods shall be arranged to minimize "short circuiting" of air and to avoid reduction in air velocity at the point of contaminant capture.

7~~.31.~~.34.D14. Laboratory fume hoods shall meet the following general standards:

a. Have an average face~~-~~ velocity of at least 75 feet per minute (0.38 meters per second).

b. Be connected to an exhaust system to the outside that is separate from the building exhaust system.

c. Have an exhaust fan located at the discharge end of the system.

d. Have an exhaust duct system of noncombustible corrosion-resistant material as needed to meet the planned usage of the hood.

7~~.31.~~.34.D15. Laboratory hoods shall meet the following special standards:

a. Fume hoods, and their associated equipment in the air stream, intended for use with perchloric acid and other strong oxidants, shall be constructed of stainless steel or other material consistent with special exposures, and be provided with a water wash and drain system to permit periodic flushing of duct and hood. Electrical equipment intended for installation within such ducts shall be designed and constructed to resist penetration by water. Lubricants and seals shall not contain organic materials. When perchloric

acid or other strong oxidants are only transferred from one container to another, standard laboratory fume hoods and the associated equipment may be used in lieu of stainless steel construction.

b. In new construction and major renovation work, each hood used to process infectious or radioactive materials shall have a minimum face velocity of 90 to 110 feet per minute (0.45 to 0.56 meters per second) with suitable pressure-independent air~~-~~-modulating devices and alarms to alert staff of fan shutdown or loss of airflow. Each shall also have filters with a 99.97 percent efficiency ~~[~~(based on the ~~dioctyl phthalate (~~DOP~~)~~ test method~~]~~) in the exhaust stream, and be designed and equipped to permit the safe removal, disposal, and replacement of contaminated filters. Filters shall be as close to the hood as practical to minimize duct contamination. Fume hoods intended for use with radioactive isotopes shall be constructed of stainless steel or other material suitable for the particular exposure and shall comply with NFPA 801, *Facilities for Handling Radioactive Materials*. **Note**: Radioactive isotopes used for injections, etc., without probability of airborne particulates or gases may be processed in a clean-workbench-type hood where acceptable to the Nuclear Regulatory Commission.

7~~.31.~~.34.D16. Exhaust hoods handling grease-laden vapors in food preparation centers shall comply with NFPA 96. All hoods over cooking ranges shall be equipped with grease filters, fire~~-~~-extinguishing systems, and heat-actuated fan controls. Cleanout openings shall be provided every 20 feet (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. ~~(~~Horizontal runs of ducts serving range hoods ~~should~~ shall be kept to a minimum.~~)~~ Food preparation centers shall have ventilation systems whose air supply mechanisms are interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit corridors does not compromise the exit corridor restrictions of NFPA 90A, the pressure requirements of NFPA 96, or the maximum defined in the table. The number of air changes may be reduced or varied to any extent required for odor control when the space is not in use.

7~~.31.~~.34.D17. The ventilation system for anesthesia storage rooms shall conform to the requirements of NFPA 99, including the gravity option. Mechanically operated air systems are optional in ~~this~~ these rooms.

7~~.31.~~.34.D18. The ventilation system for the space that houses ethylene oxide (ETO) sterilizers ~~should~~ shall be designed to:

a. ~~Provide a~~A dedicated (not connected to a return air or other exhaust system) exhaust system shall be provided. Refer to 29 CFR Part 1910.1047.

b. All source areas shall be exhausted, including the sterilizer equipment room, service/aeration areas, over the sterilizer door, and the aerator. If the ETO cylinders are not located in a well-ventilated, unoccupied equipment space, an exhaust hood shall be provided over the cylinders. The relief valve shall be terminated in a well-ventilated, unoccupied equipment space~~,~~ or outside the building. If the floor drain to which the sterilizer(s) discharges is not located in a well-ventilated, unoccupied equipment space, an exhaust drain cap shall be provided (coordinate with local codes).

c. ~~Ensure that g~~General airflow ~~is~~shall be away from sterilizer operator(s).

d. Provide a dedicated exhaust duct system for ETO. The exhaust outlet to the atmosphere ~~should~~ shall be at least 25 feet (7.62 meters) away from any air intake.

e. An audible and visual alarm shall activate in the sterilizer work area, and in a 24-hour staffed location,

upon loss of airflow in the exhaust system.

7~~.31.~~.34.D19. Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit workstation temperatures.

7~~.31.~~.34.D20. Where conditions permit, ~~G~~gravity exhaust may be used~~, where conditions permit,~~ for nonpatient areas such as boiler rooms, central storage, etc.

7~~.31.~~.34.D21. The energy-saving potential of variable-~~-~~air-~~-~~volume systems is recognized~~,~~ and the~~se~~ standards herein are intended to maximize appropriate use of ~~that~~ those system~~s~~s. Any system ~~utilized~~ used for occupied areas shall include provisions to avoid air stagnation in interior spaces where thermostat demands are met by temperatures of surrounding areas.

7~~.31.~~.34.D22. Special consideration shall be given to the type of heating and cooling units, ventilation outlets, and appurtenances installed in patient-occupied areas of psychiatric units. The following shall apply:

a. All air grilles and diffusers shall be of a type that prohibits the insertion of foreign objects. All exposed fasteners shall be tamper-resistant.

b. All convector or HVAC enclosures exposed in the room shall be constructed with rounded corners and shall have enclosures fastened with tamper-resistant screws.

c. HVAC equipment shall be of a type that minimizes the need for maintenance within the room.

7~~.31.~~.34.D23. Rooms used for sputum induction, aerosolized pentamadine treatments, or other cough-inducing procedures shall meet the requirements of Table 7.2 for airborne infection isolation rooms. If booths are used, refer to section 7.~~15~~18.D.~~E.~~

7~~.31.~~.34.D24. Non-central air-~~-~~handling systems~~,~~ (i.e., individual room units that are used for heating and cooling purposes) (fan-coil units, heat pump units, etc.) shall be equipped with permanent (cleanable) or replaceable filters. The filters shall have a minimum efficiency of 68 percent weight arrestance (MERV 3). These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air-~~-~~handling system with the proper filtration, as noted in Table 7.3.

***7~~.31.~~.34.D25.** Rooms where gluteraldehyde is used shall be maintained at a negative pressure with respect to surrounding areas, unless dictated otherwise for specific rooms in Table 7.2. In lieu of special ventilation, a certified, filtered recirculating hood designed for gluteraldehyde ~~can~~ may be substituted.

7.34.D26. The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., *Aspergillus* spores). These special ventilation areas shall be designed to provide directed airflow from the cleanest patient care area to less clean areas. These rooms shall be protected with HEPA filters at 99.97 percent efficiency for a 0.3 μm sized particle in the supply airstream. These interrupting filters protect patient rooms from maintenance-derived release of environmental microbes from the ventilation system components. Recirculation HEPA filters can be used to increase the equivalent room air exchanges. Constant volume airflow is required for consistent ventilation for the protected environment. If the facility determines that airborne infection isolation is necessary for protective environment patients, an anteroom should be provided. Rooms with reversible airflow provisions for the purpose of switching between protective environment and airborne infection

isolation functions are not acceptable.

7.34.D27. The infectious disease isolation room described in these guidelines is to be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. The design of airborne infection isolation (AII) rooms should include the provision for normal patient care during periods not requiring isolation precautions. Supplemental recirculating devices may be used in the patient room, to increase the equivalent room air exchanges; however, such recirculating devic es do not provide the outside air requirements. Air may be recirculated within individual isolation rooms if HEPA filters are used. Rooms with reversible airflow provisions for the purpose of switching between protective environment and AII functions are not acceptable.

7.34.D28. In new construction, horizontal offsets of duct system risers penetrating more than one floor shall not be permitted.

7~~.31.~~.34.E. Plumbing and Other Piping Systems

Unless otherwise specified herein, all plumbing systems shall be designed and installed in accordance with *National Standard Plumbing Code.*

7~~.31.~~.34.E1. The following standards shall apply to plumbing fixtures:

a. The material used for plumbing fixtures shall be nonabsorptive and acid-resistant.

b. Water spouts used in lavatories and sinks shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc.

c. General handwashing stations used by medical and nursing staff, ~~and all lavatories used by~~ patients, and food handlers shall be trimmed with valves that can be operated without hands. ~~(~~Single-~~-~~lever or wrist blade devices ~~may~~ shall be ~~used~~permitted.~~)~~ Blade handles used for this purpose shall not exceed 4-1/2 inches (114.3 millimeters) in length. Handles on clinical sinks shall be at least 6 inches (152.4 millimeters) long. Freestanding scrub sinks and lavatories used for scrubbing in procedure rooms shall be trimmed with foot, knee, or ultrasonic controls; ~~(no~~ single-~~-~~lever wrist blades~~)~~ are not permitted.

d. Clinical sinks shall have an integral trap wherein the upper portion of the water trap provides a visible seal.

e. Showers and tubs shall have nonslip walking surfaces.

7~~.31.~~.34.E2. The following standards shall apply to potable water supply systems:

a. Systems shall be designed to supply water at sufficient pressure to operate all fixtures and equipment during maximum demand. Supply capacity for hot- and cold-water piping shall be determined on the basis of fixture units, using recognized engineering standards. When the ratio of plumbing fixtures to occupants is proportionally more than required by the building occupancy and is in excess of 1,000 plumbing fixture units, a diversity factor is permitted.

b. Each water service main, branch main, riser, and branch to a group of fixtures shall have valves. Stop valves shall be provided for each fixture. Appropriate panels for access shall be provided at all valves

where required.

c. Vacuum breakers or backflow prevention devices shall be installed on hose bib~~b~~s and supply nozzles used for connection of hoses or tubing in laboratories, housekeeping sinks, bedpan-flushing attachments, ~~and~~ autopsy tables, etc.

d. Bedpan-flushing devices (may be cold water) shall be provided in each inpatient toilet room; however, installation is optional in psychiatric and alcohol-abuse units where patients are ambulatory.

e. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.

f. Systems shall be protected against cross-connection in accordance with American Water Works Association (AWWA) Recommended Practice for Backflow Prevention and Cross-connection Control.

g. Emergency eyewash and showers shall comply with ANSI Z358.1.

7~~.31.~~.34.E3. The following standards shall apply to hot water systems:

a. The water-heating system shall have sufficient supply capacity at the temperatures and amounts indicated in Table 7.4. Water temperature is measured at the point of use or inlet to the equipment. Water shall be permitted to be stored at higher temperatures.

b. Hot-water distribution systems serving patient care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet. Non-recirculated fixture branch piping shall not exceed 25 feet (7.62 meters) in length.

*c. Provisions shall be included in the domestic hot water system to limit the amount of *Legionella* bacteria and opportunistic waterborne pathogens.

d. Dead-end piping (risers with no flow, branches with no fixture) shall not be installed. In renovation projects, dead-end piping shall be removed. Empty risers, mains, and branches installed for future use shall be permitted.

7~~.31.~~.34.E4. The following standards shall apply to drainage systems:

a. Drain lines from sinks used for acid waste disposal shall be made of acid-resistant material.

b. Drain lines serving some types of automatic blood-cell counters ~~must~~ shall be of carefully selected material that will eliminate potential for undesirable chemical reactions (and/or explosions) between sodium azide wastes and copper, lead, brass, ~~and~~ solder, etc.

c. Insofar as possible, drainage piping shall not be installed within the ceiling or exposed in operating and delivery rooms, nurseries, food preparation centers, food~~-~~-serving facilities, food storage areas, central services, electronic data processing areas, electric closets, and other sensitive areas. Where exposed~~,~~ overhead drain piping in these areas is unavoidable, special provisions shall be made to protect the space below from leakage, condensation, or dust particles.

d. Floor drains shall not be installed in operating and delivery rooms.

*e. If a floor drain is installed in cystoscopy, it shall contain a nonsplash, horizontal-flow flushing bowl beneath the drain plate.

f. Drain systems for autopsy tables shall be designed to positively avoid splatter or overflow onto floors or back siphonage and for easy cleaning and trap flushing.

g. Building sewers shall discharge into community sewerage. Where such a system is not available, the facility shall treat its sewage in accordance with local and state regulations.

h. Kitchen grease traps shall be located and arranged to permit easy access without the need to enter food preparation or storage areas. Grease traps shall be of capacity required and shall be accessible from outside of the building without need to interrupt any services.

i. Where plaster traps are used, provisions shall be made for appropriate access and cleaning.

j. In dietary areas, floor drains and/or floor sinks shall be of type that can be easily cleaned by remov~~al~~ing ~~of~~the cover. ~~Provide f~~Floor drains or floor sinks shall be provided at all "wet" equipment (as ice machines) and as required for wet cleaning of floors. Copper tubing shall be provided for supply connections to ice machines. ~~Provide r~~Removable stainless steel mesh shall be provided in addition to grilled drain covers to prevent entry of large particles of waste ~~which~~ that might cause stoppages. Location of floor drains and floor sinks shall be coordinated to avoid conditions where locations of equipment make removal of covers for cleaning difficult.

7~~.31.~~.34.E5. The installation, testing, and certification of nonflammable medical gas and air systems shall comply with the requirements of NFPA 99. (See Table 7.5 for rooms requiring station outlets.)

7.34.E6. The vacuum discharge shall be located at least 25 feet from all domestic air intakes, doors, and operable windows.

7~~.31.~~.34.E~~6~~7. Clinical vacuum system installations shall be in accordance with NFPA 99. (See Table 7.5 for rooms that require station outlets.)

7~~.31.~~.34.E~~7~~8. All piping, except control-line tubing, shall be identified. All valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.

7~~.31.~~.34.E~~8~~9. ~~Hemodialysis~~
In new construction and renovation, in any hospital ~~location~~ where hemodialysis or hemoperfusion is routinely performed, ~~there shall be~~ a separate water supply and a drainage facility that does not interfere with handwashing shall be provided.

7~~.31.~~.34.E~~9~~10. When the functional program includes hemodialysis, continuously circulated filtered cold water shall be provided. Piping shall be in accordance with AAMI RD6.2.

7~~.31.~~.34.E1~~0~~1. ~~Provide c~~Condensate drains for cooling coils shall be ~~of~~a type that may be cleaned as needed without disassembly. (Unless specifically required by local authorities, traps are not required for condensate drains.) ~~Provide~~ An air gap shall be provided where condensate drains empty into floor drains. ~~Provide h~~Heater elements shall be provided for condensate lines in freezer or other areas where freezing may be a problem.

7.31..34.E112. No plumbing lines may shall be exposed overhead or on walls where possible accumulation of dust or soil may create a cleaning problem or where leaks would create a potential for food contamination.

***7.34.E13.** Where provided, interior open water features shall be equipped to safely treat water and protect occupants from infectious or irritating aerosols. The design shall limit human contact with the water. This requirement does not pertain to aquariums.

7.32 35 Electrical Standards

7.32..35.A. General

7.32..35.A1. All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99 and shall be listed as complying with available standards of listing agencies, or other similar established standards where such standards are required. Field labeling of equipment and materials will be permitted only when provided by a nationally recognized testing laboratory that has been certified by the Occupational Safety and Health Administration (OSHA) for that referenced standard.

7.32..35.A2. The electrical installations, including alarm, nurses call, and communication systems, shall be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment shall show compliance with applicable codes and standards.

~~**7.32.A3.** Shielded isolation transformers, voltage regulators, filters, surge suppressors, and other safeguards shall be provided as required where power line disturbances are likely to affect data processing and/or automated laboratory or diagnostic equipment.~~

7.32..35.B. Services and Switchboards
Main switchboards shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only. Switchboards shall be convenient for use, readily accessible for maintenance, away from traffic lanes, and located in a dry, ventilated space free of corrosive or explosive fumes, gases, or any flammable material. Overload protective devices shall operate properly in ambient room temperatures.

7.32..35.C. Panelboards
~~Panelboards serving normal lighting and appliance circuits shall be located on the same floor as the circuits they serve. Panelboards serving critical branch emergency circuits shall be located on each floor that has major users (operating rooms, delivery suites, intensive care, etc.). Panelboards serving Life Safety emergency circuits may also serve floors above and/or below.~~ Panelboards serving critical branch, equipment system, or normal system loads shall be located on the same floor as the loads to be served. Panelboards serving life safety branch loads may be located on the floor above or the floor below the loads to be served. New panelboards shall not be located in public access corridors.

7.32..35.D. Lighting

***7.32..35.D1.** The Illuminating Engineering Society of North America (IES) has developed recommended lighting levels for health care facilities. Refer to the IES publication RP-29, *Lighting for Hospitals and*

Health Care Facilities.
~~The reader should refer to the *IES Handbook.*~~

7~~.32.~~.35.D2. Approaches to buildings and parking lots, and all occupied spaces within buildings, shall have fixtures that can be illuminated as necessary.

7~~.32.~~.35.D3. Patient rooms shall have general lighting and night lighting. A reading light shall be provided for each patient. Reading light controls shall be accessible to the patient(s) without the patient having to get out of bed. Incandescent and halogen light sources that produce heat shall be avoided to prevent burns to the patient and/or bed linen. Unless specifically designed to protect the space below, ~~T~~the light source ~~should~~ shall be covered by a diffuser or lens. Flexible light arms, if used, shall be mechanically controlled to prevent the lamp from contacting the bed linen. At least one night light fixture in each patient room shall be controlled at the room entrance. Lighting for coronary and intensive care bed areas shall permit staff observation of the patient while minimizing glare.

7~~.32.~~.35.D4. Operating and delivery rooms shall have general lighting in addition to special lighting units provided at surgical and obstetrical tables. General lighting and special lighting shall be on separate circuits.

7~~.32.~~.35.D5. Nursing unit corridors shall have general illumination with provisions for reducing light levels at night.

~~**7.325.D6.** Light intensity for staff and patient needs should generally comply with health care guidelines set forth in the IES publication. Consideration should be given to controlling intensity and/or wavelength to prevent harm to the patient's eyes (i.e., retina damage to premature infants and cataracts due to ultraviolet light).~~

~~Many procedures are available to satisfy lighting requirements, but the design should consider light quality as well as quantity for effectiveness and efficiency. While light levels in the IES publication are referenced herein, those publications include other useful guidance and recommendations which the designer is encouraged to follow.~~

7~~.32.~~.35.D7. ~~Consideration should be given to the~~ As required by the functional program, special needs of the elderly shall be incorporated into the lighting design. Excessive contrast in lighting levels that makes effective sight adaptation difficult ~~should~~ shall be minimized. Refer to IES publication, RP-28, *Lighting and the Visual Environment for Senior Living*.

7~~.32.~~.35.D8. A portable or fixed examination light shall be provided for examination, treatment, and trauma rooms.

7~~.32.~~.35.D9. Light intensity of required emergency lighting shall generally comply with the IES recommendations. Egress and exit lighting shall comply with NFPA 101.

7~~.32.~~.35.E. Receptacles

7~~.32.~~.35.E1. Each operating and delivery room shall have at least six receptacles convenient to the head of the procedure table.

Each operating room shall have at least 16 simplex or eight duplex receptacles. Where mobile x-ray,

laser, or other equipment requiring special electrical configurations is used, additional receptacles distinctively marked for x-ray or laser use shall be provided.

7~~.32.~~.35.E2. Each patient room shall have duplex-grounded receptacles. There shall be one at each side of the head of each bed; one for television, if used; one on every other wall; and one for each motorized bed. Receptacles may be omitted from exterior walls where construction or room configuration makes installation impractical. Nurseries shall have at least two duplex-grounded receptacles for each bassinet. Intermediate care rooms shall have at least four duplex outlets per bed. The outlets shall be arranged to provide two duplex outlets on each side of the head of the bed. Critical care areas as defined by NFPA 99 and NFPA 70, including pediatric and newborn intensive care units, shall have at least seven duplex outlets at the head of each bed, crib, or bassinet. Trauma and resuscitation rooms shall have eight duplex outlets located convenient to the head of each bed. Emergency department examination and treatment rooms shall have a minimum of six duplex outlets located convenient to the head of each bed. Approximately 50 percent of critical and emergency care outlets shall be connected to emergency system power and be so labeled. Each general care examination and treatment table and each work table shall have access to two duplex receptacles.

7~~.32.~~.35.E3. Duplex-grounded receptacles for general use shall be installed approximately 50 feet (15.24 meters) apart in all corridors and within 25 feet (7.62 meters) of corridor ends. Receptacles in pediatric and psychiatric unit corridors shall be of the tamper-resistant type. Special receptacles marked for x-ray use shall be installed in corridors of patient areas so that mobile equipment may be used anywhere within a patient room using a cord length of 50 feet (15.24 meters) or less. If the same mobile x-ray unit is used in operating rooms and in nursing areas, receptacles for x-ray use shall permit the use of one plug in all locations. Where capacitive discharge or battery-powered x-ray units are used, special x-ray receptacles are not required.

7~~.32.~~.35.E4. Electrical receptacle cover plates or electrical receptacles supplied from the emergency systems shall be distinctively colored or marked for identification. If color is used for identification purposes, the same color shall be used throughout the facility.

7~~.32.~~.35.E5. For renal dialysis units, two duplex receptacles shall be on each side of a patient bed or lounge chair. One duplex receptacle on each side of the bed shall be connected to emergency power.

7.35.E6. LDRP rooms shall have receptacles as required for patient rooms (Section 7.35.E2); in addition, the bassinet shall have receptacles as required for nursery bassinets (Section 7.35.E2).

7~~.32.~~.35.F. Equipment

7~~.32.~~.35.F1. At inhalation anesthetizing locations, all electrical equipment and devices, receptacles, and wiring shall comply with applicable sections of NFPA 99 and NFPA 70.

7~~.32.~~.35.F2. Fixed and mobile x-ray equipment installations shall conform to articles 517 and 660 of NFPA 70.

7~~.32.~~.35.F3. The x-ray film illuminator unit or units for displaying at least two films simultaneously shall be installed in each operating room, specified emergency treatment rooms, and x-ray viewing room of the radiology department. All illuminator units within one space or room shall have lighting of uniform intensity and color value.

7~~.32.~~.35.F4. Ground-fault circuit interrupters shall comply with NFPA 70. When ground-fault circuit interrupters (GFCI) are used in critical areas, provisions shall be made to ~~i~~ensure that other essential equipment is not affected by activation of one interrupter.

~~**7.32.F5.** In areas such as critical care units and special nurseries where a patient may be treated with an internal probe or catheter connected to the heart, the ground system shall comply with applicable sections of NFPA 99 and NFPA 70.~~

***7~~.32.~~.35.F~~6~~5.** Special equipment is identified in the following sections: Critical Care Units, Newborn Nurseries, Pediatric and Adolescent Unit, Psychiatric Nursing Unit, Surgical Suites, Obstetrical Suite, Emergency Service, Imaging Suite, Nuclear Medicine, Laboratory Suite, Rehabilitation Therapy Department, Renal Dialysis Unit, Respiratory Therapy Service, Morgue, Pharmacy, Dietary Facilities, Administration and Public Areas, Medical Records, Central Services, General Stores, Linen Services.

These sections shall be consulted to ensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

~~[make this appendix to 7.33.F6] **7.32.F7.** There should be special attention paid to safety hazards associated with equipment cabling. Every attempt should be made to minimize these hazards, where practical.~~

***7~~.32.~~.35.F~~8~~6.** If operation of a scrub sink or a handwashing station in critical care areas, emergency departments, labor and delivery, and surgical suites is dependent on the building electrical service, it shall be connected to the essential electrical system.

7~~.32.~~.35.G. Nurses Calling System

7~~.32.~~.35.G1. In patient areas, each patient room shall be served by at least one calling station for two-way voice communication. Each bed shall be provided with a call device. Two call devices serving adjacent beds may be served by one calling station. Calls shall activate a visible signal in the corridor at the patient's door, in the clean work~~-~~room, in the soiled work~~-~~room, in ~~M~~medication, charting, clean linen storage, nourishment, equipment storage, and examination/treatment room(s), and at the nursing station of the nursing unit. In multi-corridor nursing units, additional visible signals shall be installed at corridor intersections. In rooms containing two or more calling stations, indicating lights shall be provided at each station. Nurses calling systems at each calling station shall be equipped with an indicating light that remains lighted as long as the voice circuit is operating.

7~~.32.~~.35.G2. A nurses emergency call system shall be provided at each inpatient toilet, bath, sitz bath, and shower room. A nurses emergency call shall be accessible to a collapsed patient lying on the floor. Inclusion of a pull cord will satisfy this standard.

The emergency call shall be designed so that a signal activated at a patient's calling station will initiate a visible and audible signal distinct from the regular nurse calling system that can be turned off only at the patient calling station. The signal shall activate an annunciator panel at the nurse station, a visible signal in the corridor at the patient's door, and at other areas defined by the functional program. Provisions for emergency calls ~~will~~ shall also be ~~needed~~ provided in outpatient and treatment areas where patients may be subject to incapacitation.

7~~.32.~~.35.G3. In areas such as critical care, recovery, ~~and~~ pre-op, and emergency, where patients are under

constant visual surveillance, the nurses call may be limited to the following:

a. ~~a~~A bedside button or station that activates a signal readily seen at the control station to summon additional assistance (see Section 7.35.G4)~~.~~

b. An emergency code resuscitation alarm to summon medical assistance from the code team.

7~~.32.~~.35.G4. A staff emergency assistance system for staff to summon additional assistance shall be provided in each operating, delivery, recovery, emergency examination, ~~and/or~~ treatment, and intermediate care area, and in critical care units, nurseries, special procedure rooms, cardiac catheterization rooms, stress-test areas, triage, outpatient surgery, admission and discharge areas, and areas for psychiatric patients, including seclusion and security rooms, anterooms and toilet rooms serving them, communal toilet and bathing facility rooms, and dining, activity, therapy, exam, and treatment rooms. This system shall annunciate ~~visually~~ visibly and audibly in the clean work~~-~~room, in the soiled work~~-~~room, in medication, charting, clean linen storage, nourishment, equipment storage, and examination/treatment room(s) if provided, and at the nursing station of the nursing unit, with backup to another staffed area from which assistance can be summoned.

7~~.32.~~.35.G5. In critical care units, recovery, and pre-op, the call system shall include provisions for an emergency code resuscitation alarm to summon assistance from outside the unit.

7~~.32.~~.35.G6. A nurse call is not required in psychiatric nursing units, but if it is included, provisions shall be made for easy removal, or for covering call button outlets. In psychiatric nursing units, all hardware shall have tamper-resistant fasteners.

7~~.32.~~.35.G7. Patient toilet rooms within the ~~I~~imaging ~~S~~suite shall be equipped with a nurses emergency call.

7~~.32.~~.35.G8. Toilet rooms in renal dialysis units shall be served by an emergency call. The ~~C~~call shall activate a signal at the nurses' station.

7~~.32.~~.35.G9. Alternate technologies ~~can may~~shall be ~~considered~~ permitted for emergency or nurse call systems. If radio frequency systems are utilized, consideration ~~should~~ shall be given to electromagnetic compatibility between internal and external sources.

7~~.32.~~.35.H. Emergency Electric Service
Emergency power shall be provided for in accordance with NFPA 99, NFPA 101, and NFPA 110. Where stored fuel is required, storage capacity shall permit continuous operation for at least 24 hours.

7~~.32.~~.35.I. Fire Alarm
All health care ~~occupancies~~ facilities shall be provided with a fire alarm system in accordance with NFPA 101 and NFPA 72.

7~~.32.~~.35.J. Telecommunications and Information Systems

7~~.32.~~.35.J1. Locations for terminating telecommunications and information system devices shall be provided.

7~~.32.~~.35.J2. A room shall be provided for central equipment locations. Special air conditioning and

voltage regulation shall be provided when recommended by the manufacturer.

7.~~32.~~35.J3. All patient care-related telecommunications and information systems shall be powered from the essential electrical system.

7.35.K. Electronic Surveillance Systems

7.35.K1. Electronic surveillance systems include but are not limited to patient elopement systems, door access/control systems, video/audio monitoring systems, patient location systems, and infant abduction prevention systems.

7.35.K2. Electronic surveillance systems are not required, but if provided for the safety of the patients, any devices in patient areas need to be mounted such that they are unobtrusive and in a tamper-resistant enclosure.

7.35.K3. Electronic surveillance system monitoring devices need to be located in a location such that they are not readily observable by the general public or patients.

7.35.K4. Electronic surveillance systems, if installed, shall be supplied power from the emergency electrical system in the event of a disruption of normal electrical power.

***7.~~3~~36 Hyperbaric Suite**

A7.~~12~~15.D. For example, separate facilities should be provided for such incompatible materials as acids and bases, and vented storage should be provided for volatile solvents.

A7.~~13~~16.D4. The facilities should be similar to a residential environment.

A7.~~14~~17.B2~~2~~3. All installed ~~RO~~ reverse osmosis water and dialysis solution piping should be accessible.

A7.17.B24. Due to the nature of the dialyzing process and the nature of the patient's illness, the temperature should be maintained at 72° to 78°F (22° to 26°C) with minimum humidity levels of 30 to 60 percent.

A7.~~16~~19.B. Autopsy rooms should be equipped with downdraft local exhaust ventilation.

A7.20.B3. Floor drainage may also be required, depending on the extent of compounding conducted.

A7.21.A. Consideration may also be required for meals to VIP suites, and for cafeterias for staff, ambulatory patients, and visitors as well as providing for nourishments and snacks between scheduled meal service.

A7.~~21~~24.A2. Clean Assembly/Workroom
Access to the sterilization room should be restricted. This room should contain Hi-Vacuum or gravity steam sterilizers and sterilization equipment to accommodate heat-sensitive equipment (ETO sterilizer) and ETO aerators. This room is used exclusively for the inspection, assembly, and packaging of medical/surgical supplies and equipment for sterilization. ~~Area~~ It should contain work~~-~~tables, counters, a handwashing station, ultrasonic storage facilities for backup supplies and instrumentation, and a drying cabinet or equipment. The area should be spacious enough to hold sterilizer carts for loading of prepared supplies for sterilization.

A7.~~30~~33.B2. Elevator car doors should have a clear opening of not less than 4.5 feet (1.37 meters).

A7.33.C1. The underlying frameworks of waste management are waste minimization and segregation. Different components of the waste stream must be kept separate from each other; facilities should seek to minimize all components of each waste stream. At a minimum, the functional program includes consideration of regular trash, medical/ infectious waste, hazardous waste, and low-level radioactive waste. The program should address the development of effective collection, transport, pest control, and storage systems; waste management and contingency planning; protecting the health and safety of workers; and proper siting of all on-site waste treatment technologies.

Optimizing waste management has programmatic and space impacts throughout the facility, at points where waste is generated, collected, and staged for disposal. For facilities or municipalities with recycling programs in place, particular consideration should be given to sorting and staging areas. The following elements are examples that may be considered:

a. Building should include adequate space to accommodate bins/carts for appropriate waste segregation such as recyclables, infectious waste, sharps, etc. Corridors and materials handling systems should be designed to achieve an efficient movement of waste from points of generation to storage or treatment while minimizing the risk to personnel.

b. Dedicated storage and flow space and cleaning/sanitation facilities should facilitate reuse of items such as medical products, food service items, and the like to eliminate disposables and reduce waste.

c. Space should be included for autoclaves, shredders, and other technologies for processing medical waste prior to removals to landfill. Secure storage should be provided for staging fluorescent lamps for recycling.

A7.33.C2.a. The EPA has identified medical waste incineration as a significant contributor to air pollution worldwide. Health care facilities should seek to minimize incineration of medical waste, consistent with local and state regulations and public health goals.

A7.33.C2.b. When incinerators are used, consideration should be given to the recovery of waste heat from on-site incinerators used to dispose of large amounts of waste materials. Incinerators should be designed in a manner fully consistent with protection of public and environmental health, both on-site and off-site, and in compliance with federal, state, and local statutes and regulations. Toward this end, permit applications for incinerators and modifications thereof should be supported by Environmental Assessments and/or Environmental Impact Statements (EISs) and/or Health Risk Assessments (HRAs) as may be required by regulatory agencies. Except as noted below, such assessments should utilize standard U.S. EPA methods, specifically those set forth in U.S. EPA guidelines, and should be fully consistent with U.S. EPA guidelines for health risk assessment. Under some circumstances, however, regulatory agencies having jurisdiction over a particular project may require use of alternative methods.

~~**A7.30.C2.d.** When incinerators are used, consideration should be given to the recovery of waste heat from on-site incinerators used to dispose of large amounts of waste materials.~~

~~**A7.30.C2.e.** Incinerators should be designed in a manner fully consistent with protection of public and environmental health, both on-site and off-site, and in compliance with federal, state, and local statutes and regulations. Toward this end, permit applications for incinerators and modifications thereof should be supported by Environmental Assessments and/or Environmental Impact Statements (EISs) and/or Health Risk Assessments (HRAs) as may be required by regulatory agencies. Except as noted below, such assessments should utilize standard U.S. EPA methods, specifically those set forth in U.S. EPA guidelines, and should be fully consistent with U.S. EPA guidelines for health risk assessment. Under some circumstances, however, regulatory agencies having jurisdiction over a particular project may require use of alternative methods.~~

A7.34.A1. Remodeling and work in existing facilities may present special problems. As practicality and funding permit, existing insulation, weather stripping, etc., should be brought up to standard for maximum economy and efficiency. Consideration should be given to additional work that may be needed to achieve this.

A7.34.A4. Systems with excessive installation and/or maintenance costs that negate long-range energy savings should be avoided.

A7.34.D Protection of HVAC systems against chemical, biological, and radiological attack should be considered. System design features that should be evaluated include protection of outside air intakes, location of return air grilles, and types of filtration. The following two documents provide additional information regarding these issues:

- *Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks*, Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health, May 2002.

- "Protecting Buildings and their Occupants from Airborne Hazards" (draft), Army Corps of Engineers, TI 853-01, October 2001.

A7.34.D1. Owing to potential operational problems for the ultraviolet germicidal irradiation (UVGI) lamps, and the fact that the effectiveness of UVGI is dependent on the airflow pattern in the room, use of UVGI may be considered as a supplement to the ventilation system design, rather than the main control mechanism. The ACH of the room should therefore be set as if no UVGI system is installed.

A7.3134.D3 Requirements to minimize cross--contamination between fresh air intakes and various exhaust outlets may be determined by engineering modeling or calculations performed in accordance with the ASHRAE *Handbook of Fundamentals.*

A7.3134.D4. The operating and delivery room ventilation systems should operate at all times to maintain the "air movement relationship to adjacent areas." The cleanliness of the spaces is compromised when the ventilation system is shut down. For example , e.g., airflow from a less clean space such as the corridor can occur, and standing water can accumulate in the ventilation system (near humidifiers or cooling coils).

The recommended air flow rate in an operating room is 20to 25 air changes per hour (ACH) for ceiling heights between 9 feet (2.74 meters) and 12 feet (3.66 meters). The system should provide a single directional flow regime, with both high and low exhaust locations. A face velocity of around 25 to 35 fpm (0.13 to 0.18 m/s) is sufficient from the non-aspirating diffuser array provided that the array size itself is set correctly. The non-aspirating diffuser array size should be set appropriately such that it covers at least the area footprint of the table plus a reasonable margin around it. In the cited study, this margin is 21 inches (0.53 meter) on the short side and 12 inches (0.3 meter) on the long side.

The above conclusions were derived from studies conducted by the National Institutes of Health, titled "Comparison of Operating Room Ventilation Systems in the Protection of the Surgical Site" (Memarzadeh 2002) and "Effect of Operation Room Geometry and Ventilation System Parameter Variations on the Protection of the Surgical Site (Memarzadeh 2004).

A7.3134.D6. See *Industrial Ventilation: A Manual of Recommended Practice*, published by the American Conference of Governmental Industrial Hygienists (www.acgih.org), for additional information.

A7.3134.D9. One way to achieve basic humidification may be accomplished by a steam--jacketed manifold--type humidifier, with a condensate separator that delivers high-quality steam. Additional booster humidification (if required) should be provided by steam--jacketed humidifiers for each individually controlled area. Steam to be used for humidification may be generated in a separate steam generator. The steam generator feedwater may be supplied either from soft or reverse osmosis water. Provisions should be made for periodic cleaning.

A7.3134.D25. Whenever possible, the gluteraldehyde should be captured at the source. If this is not possible, the room should be exhausted at a rate of 15 air changes.

A7.3134.E3.c. There are several ways to treat domestic water systems to kill *Legionella* and opportunistic waterborne pathogens. Complete removal of these organisms is not feasible, but methods to reduce the amount include hyperchlorination (free chlorine, chlorine dioxide, monochloramine), elevated hot water temperature, ozone injection, silver/copper ions, and ultraviolet light. Each of these options has advantages and disadvantages. While increasing the hot water supply temperature to 140°F (60°C) is typically considered the easiest option, the risk of scalding, especially to youth and the elderly, is

significant. Additional consideration should be given to domestic water used in bone marrow transplant units. See CDC and ASHRAE Guideline 12, "Minimizing the Risk of Legionellosis Associated with Building Water Systems," for additional information. Another reference on this topic is "*Legionella* Control in Health Care Facilities," available from the American Society of Plumbing Engineers.

A7.~~31~~34.E4.e. Floor drains in cystoscopy operating rooms have been shown to disseminate a heavily contaminated spray during flushing. Unless flushed regularly with large amounts of fluid, the trap tends to dry out and permit passage of gases, vapors, odors, insects, and vermin directly into the operating room. For new construction, if the users insist on a floor drain ~~is insisted upon by the users~~, the drain plate should be located away from the operative site, and should be over a frequently flushed nonsplash, horizontal-flow type of bowl, preferably with a closed system of drainage. Alternative methods include (a) an aspirator/trap installed in a wall connected to the collecting trough of the operating table by a closed, disposable tube system, or (b) a closed system using portable collecting vessels. (See NFPA 99.)

A7.34.E13. Open decorative water features such as fountains may represent a reservoir for opportunistic human pathogens; thus they are not recommended for installation within any enclosed spaces of health care environments. The basin should be designed to be resistant to chemical corrosion with minimal droplet production. Exhaust ventilation should be provided directly above the water feature.

A7.35.D1. Light intensity for staff and patient needs should generally comply with health care guidelines set forth in the IES publication. Consideration should be given to controlling intensity and/or wavelength to prevent harm to the patient's eyes (i.e., retina damage to premature infants and cataracts due to ultraviolet light).

Many procedures are available to satisfy lighting requirements, but the design should consider light quality as well as quantity for effectiveness and efficiency. While light levels in the IES publication are referenced herein, those publications include other useful guidance and recommendations which the designer is encouraged to follow.

A7.35.F5. Special attention should be paid to safety hazards associated with equipment cabling. Every attempt should be made to minimize these hazards, where practical.

A7.~~32~~35.F~~8~~6. Refer to NFPA 99 for a description of the essential electrical system.

A7.~~33~~ 36 Hyperbaric Suite

~~General~~

~~The number of treatment stations should be based upon the expected workload and may include several work shifts per day.~~

~~The location should offer convenient access for outpatients. Accessibility to the unit from parking and public transportation should be a consideration.~~

~~Treatment Areas~~

~~Hyperbaric chambers for multiple occupancy (Class A) should be installed in accordance with NFPA 99.~~

~~Hyperbaric chambers for individual patients (Class B) should be installed in accordance with NFPA 99 in a room or suite adequately sized to provide the following clearances: chamber and side wall, 5 feet (1.52 meters); between chambers, 6 feet (1.83 meters); and between the chamber headboard and the wall, 3 feet (0.91 meter). A minimum passage space of 4 feet (1.22 meter) shall be provided at the foot of each chamber in addition to the required clearances for sliding patients' platforms in end-loading chambers.~~

~~Functional Elements~~

~~The following support spaces should be provided and may be shared with adjacent departments.~~

~~Patient waiting area. The area should be out of traffic, under staff control, and should have seating capacity in accordance with the functional program. When the hyperbaric suite is routinely used for outpatients and inpatients at the same time, separate waiting areas should be provided with screening for visual privacy between the waiting areas.~~

~~A control desk and reception area should be provided.~~

~~A holding area under staff control should accommodate inpatients on stretchers or beds. Stretcher patients should be out of the direct line of normal traffic. The patient holding area may be omitted for two or fewer individual hyperbaric chamber units.~~

~~Toilet rooms for the use of patients should be provided with direct access from the hyperbaric suite.~~

~~Dressing rooms for outpatients should be provided and should include a seat or bench, mirror, and provisions for hanging patients' clothing and for securing valuables. At least one dressing room should be provided to accommodate wheelchair patients.~~

~~An appropriate room for individual and family consultation with referring physicians should be provided for outpatients.~~

~~A clean storage space should be provided for clean supplies and linens. Handwashing stations should be provided with hands-free operable controls. When a separate storage room is provided, it may be shared with another department when conveniently located.~~

~~A soiled holding room should be provided with waste receptacles and soiled linen receptacles.~~

~~Storage for patients' belongings should be provided.~~

~~A housekeeping room should be provided and should contain a floor receptor or service sink and storage space for housekeeping supplies and equipment; it should be located nearby.~~

~~Appropriate areas should be available for male and female personnel for staff clothing change area and lounge. The areas should contain lockers, shower, toilet, and handwashing stations.~~

~~A waiting room, toilet with handwashing stations, drinking fountain, public telephone, and seating accommodations for waiting periods should be available or accessible to the unit.~~

~~Electrical Requirements~~

~~Grounding of hyperbaric chambers should be connected only to the equipment ground in accordance with NFPA 99 and NFPA 70.~~

~~Additional grounds such as earth or driven grounds should not be permitted.~~
Applicability

These guidelines shall apply to hyperbaric facilities designated for clinical hyperbaric oxygen therapy, including hospital-affiliated and freestanding facilities.

General Facility Requirements

Hyperbaric chambers shall be constructed in conformance with applicable construction codes (ASME, PVHO-1) and carry a "U" stamp.

The facility shall be constructed to comply with applicable local, state, and national construction codes governing the type of occupancy (health care, commercial, other) housing the hyperbaric chamber(s).

Architectural requirements. When a hyperbaric suite/clinic is provided, it shall meet the requirements of Chapter 20, NFPA 99, and Chapter 12, NFPA 101.

The following service areas shall be provided for the hyperbaric facility. If the hyperbaric facility is included as an integral portion of another service such as a wound care department, service areas may be shared:

1. Reception/control desk.

2. Patient waiting area. The waiting area should be large enough to accommodate the clinical program and chamber mix if also used as a holding area. The area shall be out of traffic, under staff control, and shall have seating capacity in accordance with the functional program. When the hyperbaric suite is routinely used for outpatients and inpatients at the same time, separate waiting areas shall be provided with screening for visual privacy between the waiting areas. Patient waiting areas may be omitted for two or less Class B hyperbaric chamber units.

3. Holding area. The area shall be out of traffic flow from the chamber and shall not obstruct access to the exits. A holding area under staff control shall accommodate inpatients on stretchers or beds. Stretcher patients shall be out of the direct line of normal traffic. The patient holding area may be omitted for two or less individual hyperbaric chamber units.

4. Patient record storage area. An area should be provided that is out of traffic flow and under staff control. This can be in the clinical area or located at the reception/control desk.

5. Patient toilet rooms. Toilet rooms shall be provided with handwashing fixtures with hands-free operable controls with direct access from the hyperbaric suite.

6. Patient dressing rooms. Dressing rooms for outpatients shall be provided and shall include a seat or bench, mirror, and provisions for hanging patients' clothing and for securing valuables. At least one dressing room shall be provided to accommodate wheelchair patients.

7. Staff facilities. Toilets with handwashing fixtures with hands-free operable controls may be outside the suite but shall be convenient for staff use.

8. Consultation/treatment rooms. Appropriate room for individual consultation and treatment with referring clinicians shall be provided.

9. Storage space. A clean storage space shall be provided for clean supplies and linens. Handwashing fixtures shall be provided with hands-free operable controls. When a separate storage room is provided, it may be shared with another department.

10. Soiled holding area. A soiled holding room shall be provided with waste receptacles and soiled linen receptacles.
Handwashing stations. A lavatory equipped for handwashing with hands-free operable controls shall be located in the room where the hyperbaric chambers are located.

11. Housekeeping room. The housekeeping room shall contain a floor receptor or service sink and storage space for housekeeping supplies and equipment, and shall be located nearby.

12. Gas cylinder room. This room should be large enough to accommodate the storage of enough (H) cylinders and manifolds for the reserve breathing gases required for chamber operations. The minimum room size should be able to house eight (H) cylinders and two gas manifolds, consisting of at least two (H) cylinders on each manifold.

13. Compressor room. This area should be large enough to house the chamber compressors, accumulator tanks, fire suppression system and their ability to meet the requirements of NFPA 99, Chapter 20. The reserve breathing gases could also be housed here if it is in close proximity to the chamber room.

Multiplace (NFPA Class "A" Chamber) Facilities

The facility housing a Class A chamber shall be designed to allow rapid or emergency removal of patients and staff.

In the case of multiple Class A chambers installed in a single setting, or a Class A chamber that contains multiple compartments, the rapid or emergency removal of a patient or personnel from one chamber/compartment shall not restrict in any way the rapid and simultaneous removal of patients or personnel from all other chambers/compartments.

A minimum of two exits should be provided for the chamber room unless a single exit opens directly to a primary evacuation hallway.

The space required to house Class A chambers and supporting equipment should be defined by NFPA 99, Chapter 20 and the equipment manufacturer, but in any case shall not be less than the following:

Class A Hyperbaric Chamber Clearances
Minimum clearances around a (Class A) hyperbaric chamber shall be as follows:

1. Chamber entry should be designed for gurney/stretcher access: 10 feet (3.04 meters).

2. Entries designed for wheeled gurneys shall be provided with access ramps that are flush with the chamber entry doorway.

3. Chambers that utilize fixed internal stretcher frames and transfer gurneys shall be designed to allow immediate removal of the patient upon chamber depressurization.

4. Chamber man lock entries or compartments utilizing circular entry hatchways: 4 feet (1.21 meters).

5. The chamber should have a minimum of 4 feet (1.21 meters) of clearance all the way around the chamber, except as specified with regard to entry areas.

6. If the chamber control console is immediately adjacent to the chamber, a minimum passageway of 4 feet (1.21 meters) shall be provided between the control console and any obstruction.

Monoplace (Class B) Facilities

1. In the case of multiple Class B chambers installed in a single setting, the rapid or emergency removal of a patient from one chamber shall not restrict in any way the rapid and simultaneous removal of patients from all other chambers.

2. A minimum of two exits should be provided for the chamber room unless a single exit opens directly to a primary evacuation hallway.

3. Exit doorways shall have a minimum opening of 46 inches. (1.16 meters)

4. The space required to house Class B chambers and supporting equipment should be defined by the equipment manufacturer, but in any case shall not be less than the following:

5. The space housing Class B chambers shall conform to NFPA 99, Chapter 20 requirements.

Class B Hyperbaric Chamber Clearances
Minimum clearances between individual (Class B) hyperbaric chambers shall be as follows:

1. Chamber and side wall, 18 inches (45.72 centimeters). **Exception:** If any chamber controls, ventilation valves, or other operator-adjustable devices are located on or under the chamber adjacent to the side wall, minimum clearance shall be 36 inches (91.44 centimeters).

2. Between control side of two chambers, 48 inches (1.21 meters).

3. Between back side of two chambers, 24 inches (60.96 centimeters)

4. A minimum passage of 14 inches (35.56 centimeters) shall be provided at the foot end of each chamber. An oxygen shut-off valve shall be provided for each chamber and shall be unobstructed by the chamber and located as to be immediately accessible to the chamber operator.

5. A minimum space of 102 inches (2.59 meters) shall be available at the head end of the chamber to allow for the safe insertion and removal of the patient from the chamber.

6. Any electrical service outlets located within 10 feet of the Class B chamber entrance shall be sited no less than 3 feet (0.91 meter) above floor level.

Small Inpatient Primary Care Hospitals

*x.1 General Considerations

x.1.A. Functional Narrative

There shall be for every project a functional narrative describing the various components planned for the facility and how they will interface with each other. All necessary transfer and service agreements with higher care l hospitals shall be included in the functional narrative.

x.1.B. Standards

The small inpatient primary care hospital shall meet the general standards described herein and shall also meet the general standards outlined in the selected outpatient care functions and mobile transportable units outlined in other chapters of these guidelines.

x.1.C. Sizes

The sizes of the selected functions and their clear floor areas will depend on program requirements and organization of services as required by the community needs. Some functions may be combined or shared providing the layout does not compromise safety standards and medical nursing practices.

x.1.D. Parking

Each new facility, major addition, or major change in function shall be provided with parking spaces to satisfy the needs of the patient population, personnel, and public. In the absence of such a study, provide one space for each patient and one space for each employee normally present on any single weekday. Additional parking may be required to serve other services. Separate and additional space shall be provided for service delivery vehicles, vehicles utilized for emergency services, and mobile transportable units.

x.1.E. Transport Services

Part of the facility=s transfer agreements with higher care hospital providers may involve the use of ambulance with or without helicopter services. Where appropriate the applicable State and Local regulations governing the placement, safety features and elements required to provide such a services including garages, landing pads, approaches, lighting, and fencing shall be included in the design of ambulance with or without helicopter services.

x.1.F. Swing Beds

When the concept of swing beds is part of the functional program narrative, care shall be taken to include requirements for all intended categories.

x.2 Nursing Units

A single nursing unit shall be provided for the small primary inpatient facility. The unit shall be designed to accommodate multiple patient modalities, with adequate support spaces to accomplished the modalities referenced in the functional program. The number of patient rooms contained in the nursing unit shall be as determined by program, but shall not exceed 25 beds per unit; additional units may be incorporated into the design based on a demographic analysis and the facility's demonstrated ability to provide adequate support services for the additional beds.

Each nursing unit shall include the following:

x.2A. Patient Room

The maximum room capacity shall be no more than two patient beds as defined in Section 7.2.A. Facilities are encouraged to use these rooms as single patient rooms when not experiencing peak usage, and to utilize the additional space to accommodate the needs of family or significant others assisting in the care of the patient.

x.2.A1. New construction. In new construction, the patient room shall be designed to meet the most stringent nursing requirements articulated in the program narrative and to have a minimum of 250 square feet of clear floor area exclusive of toilet rooms, closets, wardrobes, alcoves, lockers, vestibules, or family sitting and sleeping areas, and staff service. The dimensions and arrangements of these rooms shall be such that there is a minimum of 4' 0" clear between the sides and foot of the bed and any wall or other fixed obstruction.

x.2.A2. Existing or renovation. Where existing facilities are to be renovated, each patient room shall meet the requirements of Section 7.2.A (patient rooms) and if the facility wishes to provide other inpatient overnight services they shall meet the following additional requirements:

x.2.A3. Each patient room shall have a window in accordance with Section x.28.A10.

x.2.A4. A hand washing station for the exclusive use of the staff shall be provided to serve each patient room and shall be placed outside of the patient toilet.

x.2.A5. A patient toilet room shall be provided and shall contain a water closet, hand washing station, and shower. The door to the patient toilet shall swing outward or be double acting. The patient toilet room shall be placed in-board and shall be used to provide an entry alcove where a staff work counter, hand washing sink, and storage for gowns and isolation supplies shall be provided in the event the patient in the room is suspected of or receives a diagnosis requiring air borne or contact isolation, and special room pressurization.

x.2.A6. Each patient shall have within his or her room a separate wardrobe, locker, or closet suitable for hanging full length garments and for storing personal effects.

x.2.A7. Visual privacy from casual observation by other patients and visitors shall be provided. Design for privacy shall not restrict patient access to all areas of the room.

x.2.A8. Areas for overnight stay for patient=s significant other or for the patient=s selected family care giver shall be provided. Adequate spaces for sitting, lounging, and visiting shall be provided and shall meet the needs outlined in the program narrative.

x.2.A9. Pediatric patients utilizing these rooms may have two patients placed in these rooms provided the it is not counter indicated by clinical needs of the patients. In rooms where more than one pediatric patient is placed, family care features of this chapter shall not be implemented.

x.3 Airborne Infection Isolation Rooms

If the program narrative requires a dedicated airborne infection isolation room, it shall meet the criteria established in Section 7.2.C. of these guidelines.

x.4 Protective Environme nt Rooms

If the program narrative requires a protective environment room, it shall meet the criteria established in Section 7.2.D of these guidelines.

x.5 Seclusion Rooms

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If the program narrative requires a seclusion room, it shall meet the criteria established in Section 11.2C of these guidelines.

x.6 Critical Care

The patient rooms described in this Section shall have the capability of serving as temporary critical care patient rooms in the eventuality that a patient presents itself to the facility in need of stabilization and monitoring prior to being transferred to a tertiary care facility. These rooms are intended for temporary care of patients needing transportation to an intensive care setting in a higher level facility, not for active critical care treatment. These rooms should also serve the needs of patients requiring hospice and ventilator care.

x.7 Labor Delivery Postpartum Care

The patient rooms described in this section shall have the capability of serving as LDRP rooms in the eventuality that a patient presents herself to the facility in need of such services after which arrangements for the transfer of patients to a tertiary care center with maternity programs shall be made. The second patient station in the room shall have electrical, medical gases and vacuum services to accommodate infant resuscitation needs.

x.7.A. Support Spaces for LDR Functions
If LDR/LDRP functions are programmed for these facilities, a storage area with a minimum of 100 square feet per LDR bed shall be provided for the storage of case carts, delivery equipment, and bassinets.

x.8 Service Areas

Provisions for the services listed below shall be readily available in each nursing unit. The size and location of each service area will depend upon the numbers and types of modalities served. Identifiable spaces are required for each of the indicated functions.

x.8.A. Administrative Center
This area shall be located to control access to the nursing unit and serve as a security check point for visitors and vendors entering the nursing unit. It shall have space for counters and storage and shall have convenient access to hand washing. It may include centers fr reception and communication, and shall have direct visual access to the entrance to the unit.

x.8.B. Nurses Station
With the advent and proliferation of paperless electronic information systems nurses stations are becoming de-centralized with the charting and plan of care functions taking place at the bedside.
If the program narrative emphasizes the need for a centralized nurses station it may be combined with the administrative center. If the program narrative emphasizes the need for de centralization, provisions shall be made for alcoves and work areas immediately adjacent to the patient room entrances, in the patient room vestibules adjacent to the staff hand washing station and work counters, or at the patient bed side.

Adequate provisions to insure privacy and confidentiality of records shall be taken when designing the decentralized locations.

x.8.C. Dictation Area

This area should be adjacent to but separate from the nurses station. With the advent of wireless technology this function may occur at the patient=s bedside or at a de-centralized location adjacent to the patient rooms. Adequate provisions to insure privacy and confidentiality of records shall be taken when designing the dictation area.

x.8.D. Nurse or Supervisor's Office

x.8.E. Handwashing Stations

Hand washing stations, conveniently accessible to the nurses station, medication, station and nourishment center. One hand washing station may serve several areas if convenient to each.

x.8.F. Charting Facilities

Charting facilities shall have linear surface space to ensure that staff and physicians may chart and have simultaneous access to information and communication systems. With the advent of wireless technology this function may occur at the patient=s bedside or at a de-centralized location adjacent to the patient rooms. Adequate provisions to insure privacy and confidentiality of records shall be taken when designing the dictation area. At a minimum a conference or meeting room for staff to discuss cases and patients in privacy shall be provided in the unit. This room proves useful at the change of shift.

x.8.G. Staff Toilet Room

Toilet room for the exclusive use of staff shall be conveniently located in the unit with an eye for maximum accessibility by staff.

x.8.H. Staff Lounge

Facilities shall be provided for staff and shall be programmatically sized but not less than 100 square feet in area. These facilities shall be located as close as possible to the centralized nurses station, or if a de-centralized nurses station it should be located within close proximity to the work core of the nursing unit.

x.8.I. Staff Lockers

Securable lockers, closets, cabinet compartments for the personal articles of staff shall be located in or near the nurses station and staff lounge.

x.8.J. Clean Workroom or Clean Supply Room

If the room is used for preparing patient care items, it shall contain a work counter, a hand washing station, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part a system for the distribution of clean and sterile materials the work counter and hand washing facilities may be omitted. Soiled and clean workrooms and holding rooms shall be and have no direct connection.

x.8.K. Soiled Workroom or Soiled Supply Room

This rooms shall be separated and have no direct connection to the Clean Workroom. The soiled workroom shall contain a clinical sink (or equivalent flushing rim fixture). The room shall contain a lavatory. The above fixtures shall both have a hot and cold mixing faucet. The room shall have a work counter and space for separate covered containers for soiled linen and waste. Rooms used for temporary

holding of soiled material may omit the clinical sink and work counter. If the flushing rim clinical sink is not provided, facilities for cleaning bedpans shall be provided in the patient toilet rooms.

x.8.L. Medication Station
Provisions shall be made for the distribution of medications. This may be done from a medicine preparation room or unit, from a self contained-medicine dispensing unit, or by another approved system.

x.8.L1. Medicine preparation room. This room shall be under visual control of the nursing staff. It shall contain a work counter, a sink adequate for hand washing, refrigerator and locked storage for controlled drugs. When a medicine preparation room is to be used to store one or more self-contained medicine dispensing units, the room shall be designed with adequate space to prepare medicines with the self contained medicine dispensing unit present.

x.8.L2. Self-contained medicine dispensing unit. A self contained medicine dispensing unit may be located at the nurses station, in the clean workroom, or in an alcove, provided the unit has adequate security for controlled drugs and adequate lighting to easily identify drugs. Convenient access to hand washing stations shall be provided. (Standard cup sinks in many self contained units are not adequate for hand washing).

x.8.M. Clean Linen Storage
Each nursing unit shall contain a designated area for clean linen storage. This ma be within the clean workroom, a separate closet or alcove, or an approved distribution system. If a close cart system is used, storage may be in an alcove. This cart storage must be out of the path of normal traffic, under staff control, and must be protected from contamination.

x.8.N. Nourishment Area
There shall be a nourishment area with a sink, work counter, refrigerator, storage cabinets, and equipment for hot and cold nourishment between scheduled meals. The nourishment area shall include space for trays, and dishes used for non scheduled meal service. Provisions and space shall be included for separate temporary storage of unused and soiled dietary trays not picked up at mealtime. Hand washing sinks shall be in or immediately accessible from the nourishment area.

x.8.O. Ice Machines
Each nursing unit shall have equipment to provide ice for treatments and nourishment. Ice making equipment may be in the clean work room or the nourishment room. Ice intended for human consumption shall be provided in the nourishment station and shall be served from self dispensing ice makers.

x.8.P. Equipment Storage
A room or alcove for equipment storage shall be provided for the storage of equipment necessary for patient care and as required by the functional program in each nursing unit. Each unit shall provide sufficient storage areas located on the patient floor to keep it=s required corridors width free of all equipment and supplies, but not less than 10 square feet per patient bed shall be provided.

x.8.Q. Patient Toilet Rooms
In addition to those serving bed areas, patient toilet rooms shall be conveniently located to multipurpose. Patient toilet rooms located within the multipurpose rooms may be also designated for public use.

x.8.R. Emergency Equipment Storage

Space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a cardiopulmonary resuscitation (CPR) cart. This space shall be located in an area appropriate tot he functional program, but out of normal traffic.

x.8.S. Housekeeping Room
A housekeeping room shall be provided for each nursing unit. It shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment shall be made within the room.

x.8.T. Hemo-dialysis and Hemo-perfusion
Facilities where hemo-dialysis and hemo-perfusion are routinely performed, there shall be a separate water supply and drainage facilities that do not interfere with required staff, visitors, and patient hand washing functions. If perfusion or dialysis occurs at the patient bedside a separate outlet for de-ionized water and drainage of effluent shall be provided at the patient bedside. It shall be located to prevent contact with electrical outlets and equipment and from potential water droplet contamination of the patient, staff and visitors.

x.9. Common Elements for Small Inpatient Primary Care Centers

The following elements shall apply to each inpatient primary care centers. These components may fall under the business occupancy provisions of the Life Safety and Building Codes being used. The requirements for inpatient corridors of 8'-0" in minimum width shall apply to these common elements whenever inpatients have customary access treatment and use of the spaces.

x.9.A. Administration and Public Areas
x.9.A1. Entrance. Must be located at grade level and able to accommodate wheelchairs.

x.9.A2. Public service areas.

a. conveniently accessible by handicapped

b. wheelchair storage areas out of the path of traffic

c. reception and information counter or desk located to control the entrance to the facility and monitor visitors and presenting patients

d. waiting spaces

e. public telephones

f. public toilets for male and female

g. drinking fountains

h. enclosed vending area

x.9.A3. Interview spaces. Interview spaces fr private interviews related to social services, credit, patient intake shall be provided and shall be designed for confidentiality and privacy.

x.9.A4. Offices. General and individual offices for business transactions, medical records, administrative and professional staff, photocopying shall be provided.

x.9.A5. Clerical . General clerical spaces or rooms for typing, clerical work, filing, separated from the public areas for confidentiality, shall be provided.

x.9.A6. Information technology spaces. If a paperless information management system is provided, the following spaces shall be included in the facility:

a. Data processing rooms.

b. IT closets throughout the facility connected to the data processing room by cable trays and accessories. A minimum clear space between the equipment and closet walls of two feet on all four sides of the equipment shall be provided. A maximum distance between IT closets shall not exceed three hundred feet.

x.9.A7. Tele-medicine support. In facilities where tele-medicine is contemplated adequate spaces to support the tele-medicine functions shall be planned in conjunction with information technology spaces. Satellite linkages, communication and viewing rooms and consoles, consultation spaces, electronic interview rooms, and satellite hook ups shall be considered when planning the spaces.

x.9.A8. Multipurpose rooms. Multipurpose rooms equipped for visual aids shall be provided for conferences, training, meetings, health education programs, and community outreach activities shall be provided.

x.9.A9. Staff storage spaces. Storage spaces for staff=s personal effects with locking drawers or cabinets shall be provided. Such storage shall be near individual work stations and staff control.

x.9.A10 General storage. Facilities for storage of general supplies and equipment needed for continuing operation shall be provided.

x.9.B. Clinical Facilities

As dictated by the program and community needs (and agreements with tertiary care centers) the following elements shall be provided for clinical services:

x.9.B1. General purpose examination rooms. General purpose examination rooms for medical obstetrical, and similar functions shall be provided and shall have a minimum clear floor area of 80 square feet, excluding vestibules, toilets, and closets. Room arrangement should permit at least two feet eight inches of clearances around the examination table. A hand washing sink and a counter of shelf space for writing shall be provided.

x.9.B2. Special purpose examination rooms. Rooms for special clinics such as eye, ear, nose, and throat examinations shall be designed and outfitted to accommodate procedures and equipment used. A hand washing sink and a counter or shelf space for writing shall be provided.

x.9.B3. Treatment rooms. Rooms for minor surgical and cast procedures shall have a minimum floor area of one hundred and twenty square feet, excluding vestibule, toilet, and closets. The minimum room dimension shall be ten feet clear. A hand washing sink and a counter or shelf for writing shall be provided.

x.9.B4. Observation rooms. Rooms for the isolation of suspect or disturbed patients shall have a minimum floor area of eighty square feet and shall be convenient to a nurse or control station. This is to permit close observation of patients and to minimize possibilities of patients= hiding escape, injury, or suicide. And examination room may be modified to accommodate this function. A toilet room with lavatory should be immediately accessible.

x.9.B5. Work station. A work station with counter, communication system, space for supplies and provisions for charting shall be provided. If a fully integrated electronic information management system is planned. A centralized work station controlling all ingress and egress to the unit shall be provided, additional alcoves or spaces within individual rooms shall be provided to accommodate the information technology equipment needed to accomplish the integration.

x.9.B6. Drug distribution station. This may be part of the work station and shall include a work counter, sink, refrigerator, and locked storage for biologicals and drugs. If a self-contained medicine dispensing unit is provided, it may be located at the work station, in the clean workroom, or in an alcove, provided the unit has adequate security for controlled drugs and adequate lighting to easily identify drugs. Convenient access to hand washing stations shall be provided. (Standard cup sinks in many self contained units are not adequate for hand washing).

x.9.B7. Clean storage. A separate room or closet for storing clean and sterile supplies shall be provided. This storage shall be in addition to that of cabinets and shelves.

x.9.B8. Soiled holding. A room for the separate holding of soiled storage collection, and disposal shall be provided. A flushing rim clinical service sink is recommended.

x.9.B9. Sterilizing facilities. A system for sterilizing equipment and supplies shall be provided. Sterilizing procedures may be done on or off site as long as the off site location is monitored by the facility regularly and meets the facilities infection control criteria for sterilizing locations and transportation and handling methods for sterilized supplies. Disposal supplies may be used to satisfy the facilities needs.

x.9.B10. Wheelchair storage. Wheelchair storage spaces shall be out of the line of traffic.

x.9.C. Radiology
Basic diagnostic procedures shall be provided including the following:

x.9.C1. Radiographic rooms. See Section 7.10 for special requirements.

x.9.C2. Film processing facilities. (If part of a PAC system film processing may be retained for emergency use and film development for special cases).

x.9.C3. Viewing and administrative areas.

x.9.C4. Storage facilities for film and equipment.

x.9.C5. Toilet rooms with handwashing stations accessible to dressing rooms, work stations, fluoroscopy rooms shall be provided.

x.9.C6. Dressing rooms or booths, as required by services provided, with convenient toilet access.

x.9.D. Tele -medicine.
If the facility has tele-medicine agreements with tertiary care centers the following support spaces for the mobile transportable units, staff, and patients shall be provided.

x.9.D1. Reception and waiting. A reception and waiting area for patients and visitors shall be provided sized according to program needs. The area shall be equipped with public and staff toilets.

x.9.D2. Staging area. A staging area for privacy isolation of inpatients awaiting diagnostic treatment shall be provided in a triage area located near the patient corridor but separate from the corridor to ensure proper isolation and privacy. The staging/area shall be equipped with hand-washing sinks aseptically operated without the use of hands, and mechanical means to provide negative air pressure to the surrounding areas.

x.9.D3. Gowning, lockers, and waiting. Spaces for outpatient dressing and undressing, securing of valuables and garments, and waiting for scheduled procedures shall be provided. Provisions for visual and sound privacy shall be made in these spaces. Male and Female gowning, lockers, and waiting shall be separate. A toilet for patient use shall be provided.

x.9.D4. Consultation rooms. Rooms for staff viewing and consultation with the tertiary care specialist shall be provided. Privacy and confidentiality of patients records and discussions shall be considered when designing these rooms. Consultation rooms shall be provide at a ratio of one room per mobile transportable unit access port.

x.9.D5. Mobile transportable unit access ports. A weather enclosure to protect the transportable unit and patient from the elements shall be a main consideration when considering placement and enclosure of these spaces. Depending on the program narrative and identified community needs one or more ports shall be provided for use by
the facility and the tertiary care center.

x.9.D6. Special life safety needs. The placement of the mobile transportable unit and the unit itself shall be integrated with all of the facilities life safety systems including interconnection to the facility=s fire alarm, sprinkler, security, and exiting systems.

x.9.E. Laboratory
Facilities shall be provided within the outpatient department, or through and effective contract arrangement with a tertiary care center for hematology, clinical chemistry, urinalysis, cytology, pathology, and bacteriology. If these services are provided on contract the following support spaces shall be provided in the facility:

x.9.E1. Stat laboratory. A laboratory room with work counters, storage shelving and cabinets, vented flammable storage units. hand washing sink, vacuum, gas, and electric services shall be provided. Blood Storage Facilities meeting the Clinical Laboratory Improvement Act standards for blood banks shall be provided.

x.9.E2. Specimen collection. Specimen collection facilities with pass through toilet for collection of urine and solid samples, blood drawing cubicles, adequate seating spaces, storage spaces for specimen collection supplies, and work counters for the preparation, labeling and storage of specimens awaiting pick up shall be provided.

x.9.F. Surgical Facilities

Surgical facilities for the Small Inpatient Primary Care Center shall meet the criteria established for Outpatient Surgical Facilities Sections 9.5.E through L. The type of surgical procedures that are to occur in these facilities shall be limited to those that can be performed and supported under an ambulatory surgical setting. Such facilities shall meet all criteria established under Chapter 20 of the 2000 Edition of the Life Safety Code, NFPA 101.

x.9.G. Emergency Facilities

Emergency facilities for the Small Inpatient Primary Care Center shall meet the criteria established for Freestanding Emergency Facilities Sections 9.6.A through L.

x.9.G1. Helicopter and ambulance services must be provided to ensure the timely transfer of patients presenting to the emergency room of the primary care inpatient center to a tertiary care center. The helicopter pad and ambulance ports must be within close proximity of the emergency suite and the designated patient rooms holding patients requiring transfer to a tertiary care center for treatment after stabilization.

x.9.H. Additional Diagnostic and Treatment Facilities

Additional diagnostic and treatment facilities for the Small Inpatient Primary Care Center shall meet the criteria established for Freestanding Outpatient Diagnostic and Treatment Facilities Sections 9.8, 9.9, 9.10, 9.30, 9.31, and 9.32.

x.9.I. Housekeeping Rooms

At a minimum one housekeeping room per support unit or suite shall be provided. They shall contain storage spaces for clean supplies, sink and cleaning equipment. The room shall have at a minimum a clearance of two feet around the cleaning equipment.

x.9.J. Engineering Services and Equipment

The following shall be provided:

x.9.J1. Equipment rooms. For boilers, mechanical equipment, and electrical equipment, with a minimum clearance around the equipment of two feet six inches for ease of maintenance.

x.9.J2. Storage rooms. For supplies and equipment.

x.9.J3. Waste processing services

a. Space and facilities shall be provided for the sanitary storage and disposal of waste.

b. If incinerators and or trash chutes are used, they shall comply with NFPA 82.

c. Incinerators if used shall comply with all local air pollution regulations.

x.10. Special Systems

Section 7.30 of these guidelines, and related schedules shall apply to this chapter.

x.11. Mechanical Standards

Section 7.31 of these guidelines, and related schedules shall apply to this chapter.

x.12. Electrical Standards

Section 7.32 of these guidelines, and related schedules shall apply to this chapter.

x.13. Security Systems

Consideration shall be given in the design of these facilities for active and passive security systems. Locking arrangements, security alarms and monitoring devices shall be placed carefully, and shall not interfere with the life and safety features necessary to operate and maintain a healthy and functional environment.

*Ax.1 Since the early 1990s, the health care community has been looking at the traditional hospital models (and nursing homes also built under the HB hospital model) and their delivery of care roles as established in the 1947 Hill Burton Act. The Kellogg Foundation Report titled "Hospital Community Benefits Standards," published in the early 1990s, stated that to eliminate identified health disparities, all primary care providers should become more community responsive in their orientation and should develop coalitions with local health departments, community health centers, and the communities they serve.

The purpose of the small inpatient primary care center and satellite hospital model is to provide a community-focused, short-term overnight stay environment (96 hours or less) designed to provide primary care to the patient population within a designated rural or underserved community based on the Federal Standard Metropolitan Area and defined under the Federal Code of Regulations 42 CFR 5.1.

The concept of the model is to allow an adaptable facility that can meet the needs of the community it serves. It is intended to serve as a stand-alone overnight facility (maximum of 96 hours), to have outpatient treatment modalities connected to it, and to serve as a small inpatient primary care center or as a satellite of an existing hospital in a rural or designated underserved population area. These facilities may be attached and operated as part of a local health department complex or an ambulatory surgery treatment center; in fact, this is encouraged. There must be transfer, service, and reciprocity agreements with general hospitals and tertiary care hospitals as a pre-requisite for using this model.

8. NURSING FACILITIES

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

8.1 General Conditions

***8.1.A. Applicability**
This section covers the continuum of nursing services listed below, which may be provided within freestanding facilities or as distinct parts of a general hospital or other health care facility. It~~, and~~ represents minimum requirements for new construction and shall not be applied to existing facilities unless major construction renovations (see Section 1.3.A) are undertaken.

The continuum of nursing services and facilities may be distinguished by the levels of care, staffing support areas and service areas provided and classified as:

- Nursing and skilled nursing facilities.
- Special care facilities, including:
  - Subacute care facilities (Section 8.7).
  - Alzheimer's and other dementia units (Section 8.8).

8.1.B. Ancillary Services
When the nursing facility is part of, or contractually linked with, another facility, services such as dietary, storage, pharmacy, linen~~ services~~, and laundry may be shared insofar as practical. In some cases, all ancillary service requirements will be met by the principal facility and the only modifications necessary will be within the nursing facility. In other cases, programmatic concerns and requirements may dictate separate services.

8.1.C. Environment of Care
Nursing facilities shall be designed to provide flexibility in order to meet the changing physical, medical, and psychological needs of the residents. The facility design shall produce a supportive environment to enhance and extend quality of life for residents and facilitate wayfinding while promoting privacy, dignity, and self-determination. The architectural design—through the organization of functional space, the specification of ergonomically appropriate and arranged furniture and equipment, and the selection of details and finishes—shall eliminate as many barriers as possible to effective access and use by residents of all space, services, equipment, and utilities appropriate for daily living.

While there are similarities in the spatial arrangement of hospitals and nursing facilities, the service requirements of long-term care residents will require additional special design considerations. When a section of an acute-care facility is converted, it may be necessary to reduce the number of beds to provide space for long-term care services. Design shall maximize opportunities for ambulation and self-care, socialization, and independence and minimize the negative aspects of an institutional environment.

8.1.D. Site
See Sections 3.1 and 3.3 for requirements regarding location and environmental pollution control.

8.1.E. Roads
Roads shall be provided within the property for access to the main entrance and service areas. Fire department access shall be provided in accordance with local requirements. The property or campus shall be marked to identify emergency services or departments.

8.1.F. Parking
In the absence of local requirements, each nursing facility shall have parking space to satisfy the needs of residents, employees, staff, and visitors. The facility shall provide a minimum of one space for every four beds.

8.1.G. Program of Functions
The sponsor for each project shall provide a functional program for the facility (see Section 1.1.F~~ of this document~~).

8.1.H. Services
Each nursing facility shall, as a minimum, contain the elements described within the applicable paragraphs of this section. However, when a project calls for the sharing or purchase of services, appropriate modifications or deletions in space and parking requirements may be made.

8.1.I. Renovation
See Section 1.3.

8.1.J. Provisions for Disasters
See Section 1.5.

8.1.K. Codes and Standards
See Section 1.6.

8.1.L. Equipment
See Chapter 4.

8.1.M. Phasing, Design, and Construction
See Chapter 5.

8.1.N. Record Drawings and Manuals
See Chapter 6.

8.2 Resident Unit

Each resident unit shall comply with the following:

***8.2.A. Size and Configuration**
Resident units are groups of resident rooms, staff work areas, service areas, and resident support areas~~,~~ whose size and configuration are based upon organizational patterns of staffing, functional operations, and communications~~,~~ as provided in the functional program for the facility. In the absence of local requirements, consideration shall be given to restricting the size of the resident unit to 60 beds or a

maximum travel distance from the staff station to a resident room door of 150 feet (45.72 meters). Arranging groups of resident rooms adjacent to decentralized service areas, optional satellite staff work areas, and optional decentralized resident support areas is acceptable. In new construction, resident units shall be arranged to avoid unrelated travel through resident units.

8.2.B. Resident Rooms
Each resident room shall meet the following requirements:

***8.2.B1.** Maximum room occupancy in renovations (less than 50 percent change) shall be four residents; two residents in new construction. Based upon the functional program, provisions shall be made for individual occupancy when medically or behaviorally indicated. Maximum room occupancy in new construction and renovations (more than 50 percent of current facility replacement cost) shall be two residents.

***8.2.B2.** Room size (area and dimensions) shall be determined by analyzing the needs of the resident(s) to move about the room in a wheelchair, gain access to at least one side of his or herthe bed, turn and wheel around the bed, to gain access to a window and to the resident's toilet room, wardrobe locker, or closet, and to the resident's possessions or equipment, including chair, dresser, and night-stand. Room size and configuration shall permit resident(s) options for bed location(s), and make provision for visual privacy. In multiple-bed rooms, clearance shall allow for the movement of beds and equipment without disturbing residents. Clear access to one side of the bed shall be provided along 75 percent of its length. In multiple-bed rooms, clearance shall allow for the movement of beds and equipment without disturbing other residents. Mechanical and fixed equipment shall not obstruct access to any required element. These guidelines shall allow arrangement of furniture that may reduce these access provisions, without impairing access provisions for other occupants.

8.2.B3. Each room shall have a window that meets the requirements of Section 8.14.A4.

8.2.B4. A Hhandwashing stations shall be provided in each resident room. They It may be omitted from a single--bed or two--bed room when such a handwashing station is located in an adjoining toilet room serving that room only.

***8.2.B5.** Each resident shall have access to a toilet room without having to enter the corridor area. One toilet room shall serve no more than two residents in new construction and no more than four beds or two resident rooms in renovation projects. The toilet room shall contain a water closet and handwashing station and (where permitted) a horizontal surface for the personal effects of each resident. Doors to toilet rooms may be hinged, or where local requirements permit, sliding or folding doors may be used, provided adequate provisions are made for acoustic privacy and resident safety. Toilets utilized used by residents shall be provided sufficient clearance on both sides of the water closet to enable physical access and maneuvering by staff, who may have to assist the resident in wheelchair-to-water--closet transfers and returns. Where independent transfers are feasible, alternative grab bar configurations shall be permitted. A mirror for resident use shall be provided in the toilet room.

8.2.B6. Each resident bedroom shall have be provided a separate wardrobe, locker, or closet with minimum clear dimensions of 1 foot 10 inches (558.8 millimeters) depth by 1 foot 8 inches (508.

millimeters) width. A clothes rod and shelf shall be provided at heights accessible to the resident. Accommodations shall be made for storage of full-length garments. The shelf may be omitted if the unit provides at least two drawers.

8.2.B7. Visual privacy shall be provided for each resident in multiple-bed rooms. Design for privacy shall not restrict resident access to the toilet, room entrance, window, or other shared common areas in the resident room.

8.2.B8. Beds shall be no more than two deep from windows in new construction and three deep from windows in renovated construction.

8.2.B9. Resident rooms designated for ventilator dependency shall have one emergency powered duplex electrical outlet, one centrally piped oxygen outlet, and one centrally piped vacuum inlet.

8.2.C. Service Areas

The size and features of each service area will depend upon the number and types of residents served. Although identifiable spaces are required for each indicated function, consideration will be given to multiple-use design solutions that provide equal, though unspecified, areas. Service areas may be arranged and located to serve more than one resident unit, but at least one such service area shall be provided on each resident floor unless noted otherwise. Except where the words *room* or *office* are used, service may be provided in a multipurpose area. The following service areas shall be located in or be readily accessible to each resident unit:

***8.2.C1.** Staff work area(s). Resident units shall have staff work areas in central or decentralized direct care locations. Where caregiving is organized on a central staffing model, such work areas shall provide for charting or transmitting charted data and any storage or administrative activities. Where caregiving is decentralized, supervisory work areas need not accommodate charting activities, nor have direct visualization of resident rooms, because such functions shall be accomplished at the decentralized direct care staff work areas, which shall provide for charting or transmitting charted data and any storage or administrative activities required by the functional program. ~~Depending upon the type of service and care plan to be provided, direct care staff work areas need not be encumbered with all of the provisions for a supervisory administrative staff work area. In some decentralized arrangements, caregiving functions may be accommodated at a piece of residential furniture (such as a table or a desk) or at a work counter recessed into an alcove off a corridor or activity space, with or without computer and communications equipment, storage facilities, etc.~~

8.2.C2. Toilet room(s). They shall contain water closets with handwashing stations for staff and may be unisex.

8.2.C3. Lockable closets, drawers, or compartments ~~shall be provided~~ for safekeeping of staff personal effects such as handbags~~, etc~~.

8.2.C4. Staff lounge area(s). These areas ~~shall be provided and~~ may be shared by more than one resident unit or service.

8.2.C5. Clean workroom or clean supply room. If the room is used for preparing resident care items, it

shall contain a work counter, a handwashing station, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and handwashing station may be omitted.

8.2.C6. Soiled utility or soiled holding room. ~~This~~ It shall contain a clinical sink or equivalent flushing-rim fixture with a rinsing hose or a bed~~-~~pan sanitizer, handwashing station, soiled linen receptacles, and waste receptacles in number and type as required by the functional program.

8.2.C7. Medication station. Provision shall be made for 24-hour distribution of medications. A medicine preparation room, a self-contained medicine-dispensing unit, or other system may be used for this purpose. The medicine preparation room, if used, shall be visually controlled from the staff work area. It shall contain a work counter, sink, refrigerator, and locked storage for controlled drugs. It shall have a minimum area of 50 square feet (4.65 square meters). A self-contained medicine-dispensing unit, if used, may be located at the staff work area, in the clean workroom, in an alcove, or in other space convenient for staff control. Convenient access to handwashing stations shall be provided. (Standard "cup" sinks provided in many self-contained units are not adequate for handwashing.)

8.2.C8. Clean linen storage. A separate closet or designated area shall be provided. If a closed-cart system is used, storage may be in an alcove where staff control can be exercised.

8.2.C9. Nourishment station. The area shall contain a work counter, refrigerator, storage cabinets, and a sink for serving nourishments between meals. Ice for residents' consumption shall be provided by ice-maker units. Where accessible to residents and the public, ice-maker units shall be self-dispensing. Ice makers shall be located, designed, and installed to minimize noise (and may serve more than one nourishment station). The nourishment station shall include space for trays and dishes used for nonscheduled meal service and may also be used as a pantry for food service adjacent to a resident's dining room or area. Handwashing stations shall be in or immediately accessible from the nourishment station.

8.2.C10. Storage. Space for wheelchairs and other equipment shall be located away from normal traffic.

***8.2.C11.** Resident bathing facilities. A minimum of one bathtub or shower shall be provided for every 20 residents (or a major fraction thereof) not otherwise served by bathing facilities in resident rooms. Residents shall have access to at least one ~~bathtub~~ bathing unit room per floor or unit, sized to permit assisted bathing in a tub or shower. The bathtub in this room shall be accessible to residents in wheelchairs, and the shower shall accommodate a shower gurney with fittings for a resident in a recumbent position. Other showers or tubs shall be in an individual room(s) or enclosure(s) with space for private use of the bathing fixture, for drying and dressing and access to a grooming location containing a ~~sink~~handwashing station, mirror, and counter or shelf.

A separate toilet shall be provided within or directly accessible to each resident's bathing facility without requiring entry into the general corridor. ~~This~~ It may also serve as the toilet-training facility.

8.3 Resident Support Areas

*8.3.A. Area Need

The space needed for dining and recreation shall be determined by considering (a) needs of residents to use adaptive equipment and mobility aids and receive assistance from support and service staff; (b) the extent to which support programs shall be centralized or decentralized; and (c) the number of residents to be seated for dining at one time, as required by the functional program.

In new construction, the total area set aside for dining, resident lounges, and recreation ~~areas~~ shall be at least 35 square feet (3.25 square meters) per bed with a minimum total area of at least 225 square feet (20.90 square meters). At least 20 square feet (1.86 square meters) per bed shall be available for dining. Additional space may be required for outpatient day care programs.

For renovations, at least 14 square feet (1.30 square meters) per bed shall be available for dining. Additional space may be required for outpatient day care programs.

Nothing in these ~~g~~Guidelines is intended to restrict a facility from providing additional square footage per resident beyond what is required herein for dining rooms, activity areas, and similar spaces.

8.3.B. Storage
Storage space(s) for supplies, resident needs, and recreation shall be provided near their points of use, as required by the functional program.

8.3.C. Telephone
Provisions shall be made convenient to each nursing unit to allow residents to make and receive telephone calls in private, unless otherwise indicated by the functional program.

8.3.D Soiled Linen
A receiving, holding, and sorting room shall be provided for control and distribution of soiled linen. Discharge from soiled linen chutes shall be received in a separate room.

***8.4 Activities**

If ~~included in~~required by the functional program, the minimum requirements for new construction shall include:

8.4.A. Storage for large items used for large group activities~~,~~ (e.g., recreation and exercise equipment; materials, supplies for religious services)~~, etc.,~~ placed near the location of the planned activity~~,~~ and at the point of first use.

8.4.B. A space for small group and "one on one" activities, ~~which shall be~~ readily accessible to the residents.

***8.4.B1.** Space and equipment for carrying out each of the activities defined in the functional program.

8.4.B2. Resident toilet room(s) convenient to the area.

Nothing in these ~~g~~Guidelines is intended to restrict a facility from providing additional square footage per resident beyond what is required herein for activities.

8.5 Rehabilitation Therapy

Each nursing facility ~~which~~ that provides physical and/or occupational therapy services for rehabilitating long-term care residents shall have areas and equipment that conform to program intent. Where the nursing facility is part of a general hospital or other facility, services may be shared as appropriate.

8.5.A. Physical and Occupational Therapy Provisions: Inpatient/Outpatient
As a minimum, the following shall be located on-site, convenient for use:

8.5.A1. Space for files, records, and administrative activities.

8.5.A2. Provisions for wheelchair residents.

8.5.A3. Storage for supplies and equipment.

8.5.A4. Handwashing stations within the therapy unit.

8.5.A5. Space and equipment for carrying out each of the types of therapy that may be prescribed.

8.5.A6. Provisions for resident privacy.

8.5.A7. Housekeeping rooms, in or near unit.

8.5.A8. Resident toilet room(s), usable by wheelchair ~~residents~~occupants.

8.5.B. Physical and Occupational Therapy for Outpatients
If the program includes outpatient treatment, additional provisions shall include:

8.5.B1. Convenient facility access usable by the disabled.

8.5.B2. Facilities for dressing, and ~~L~~lockers for storing patients' clothing and personal effects.

8.5.B3. ~~Outpatient facilities for dressing.~~Toilet facilities dedicated for outpatient use.

8.5.B4. Shower~~(s)~~, if required by the functional program ~~for patients' use~~.

8.5.B5. Waiting area for outpatients and public. These shall be in addition to and separate from required resident support and activity areas. Public toilets shall be provided convenient to these waiting areas.

***8.6 Personal Services (Barber/Beauty) Areas**

Facilities and equipment for resident hair care and grooming shall be provided separate from the resident rooms. These may be unisex and ~~can~~ may be located adjacent to central resident activity areas, provided that location and scheduling preserve patient dignity. Resident toilets shall be readily accessible to the hair

and grooming area(s).

*8.7 Subacute Care Facilities

8.8 Alzheimer's and Other Dementia Units

***8.8.A. Safety~~.~~**
Safety concerns must be emphasized because of poor judgment inherent in those with dementia. Areas or pieces of furniture that could be hazardous to these residents ~~should~~ shall be eliminated or designed to minimize possible accidents.

8.8.A1. Doors. ~~The~~Resident security ~~of the resident~~ shall be addressed through systems that secure the unit and comply with life safety codes. Should the functional program (see Section 1.1.F) justify limiting the movements of any resident(s) for their safety, any door locking arrangements shall be in full compliance with applicable requirements of NFPA 101. A secure unit shall contain appropriate activity area(s), dining, bathing, soiled linen/utility, and staff work area.

8.8.A2. Windows. Operable windows shall be permitted and shall comply with Sections 8.14.A3 and 8.14.A4.

***8.8.B. Outdoor Spaces~~.~~**
Secure outdoor gardens and lounge areas shall be available for residents of the Alzheimer's/dementia resident unit.

***8.8.C. Activities~~.~~**
Activity space for resident use in dementia programs shall be provided.

8.9 Dietary Facilities

The following services shall be provided:

8.9.A. General
Food service facilities and equipment shall conform with these standards and other applicable food and sanitation codes and standards and shall provide food service for residents.

Food receiving, storage, and preparation areas shall facilitate quality control. Provision shall be made for transport of hot and cold foods~~,~~ as required by the functional program. Separate dining areas shall be provided for staff and for residents. The design and location of dining facilities shall encourage resident use.

Facilities shall ~~also~~ be furnished to provide nourishments and snacks between scheduled meal service.

The dietary facility shall be easy to clean and to maintain in a sanitary condition.

8.9.B. Functional Elements
If the dietary department is on-site, the following facilities, in the size and number appropriate for the type of food service selected, shall be provided:

8.9.B1. A control station for receiving and controlling food supplies.

8.9.B2. Storage space, including cold storage, for at least a four-day supply of food. (Facilities in remote areas may require proportionally more food storage facilities.)

8.9.B3. Food preparation facilities. Conventional food preparation systems require space and equipment for preparing, cooking, and baking. Convenience food service systems using frozen prepared meals, bulk packaged entrees, individual packaged portions, or those using contractual commissary services~~,~~ require space and equipment for thawing, portioning, cooking, and~~/or~~ baking.

8.9.B4. Handwashing station(s) located in the food preparation area.

8.9.B5. Facilities for assembly and distribution of patient meals.

8.9.B6. Separate dining spaces for residents and staff.

8.9.B7. Ware-washing space ~~located~~ in a room or an alcove separate from the food preparation and serving area. Commercial-type ware-washing equipment shall be provided. Space shall ~~also~~ be provided for receiving, scraping, sorting, and stacking soiled tableware and for transferring clean tableware to the using areas. Convenient handwashing stations shall be ~~available~~ provided.

8.9.B8. Pot-washing facilities.

8.9.B9. Storage areas and sanitizing facilities for cans, carts, and mobile-tray conveyors.

8.9.B10. Waste, storage, and recycling facilities (per local requirements) located in a separate room easily accessible to the outside for direct pickup or disposal.

8.9.B11. Office(s) or desk spaces for dietitian(s) and/or a dietary service manager.

8.9.B12. Toilet for dietary staff convenient to the kitchen area.

8.9.B13. A housekeeping room located within the dietary department. ~~This~~ It shall include a floor receptor or service sink and storage space for housekeeping equipment and supplies.

8.9.B14. Ice-making facilities. They~~se~~ may be located in the food preparation area or in a separate room.~~,~~ They shall be easily cleanable and convenient to the dietary function.

8.10 Administrative and Public Areas

The following shall be provided:

8.10.A. Vehicular Drop-Off and Pedestrian Entrance
This shall be at grade level, sheltered from inclement weather, and accessible to the disabled.

8.10.B. Administrative/Lobby Area
This shall include:

a. A counter or desk for reception and information.

b. Public waiting area(s).

c. Public toilet facilities.

d. Public telephone(s).

e. Drinking fountain(s).

8.10.C. General or Individual Office(s)
These shall be provided for business transactions, admissions, social services, medical and financial records, and administrative and professional staff. ~~There shall be included p~~Provisions for private interviews shall be included.

8.10.D. Multipurpose Room(s)
~~There shall be a~~A multipurpose room for conferences, meetings, and health education purposes shall be provided as required by the functional program; it shall include provisions for the use of visual aids. One multipurpose room may be shared by several services.

8.10.E. Office Space
Clerical files and staff office space shall be provided as required by the functional program.

8.10.F. Supply Room
Space for storage of office equipment and supplies shall be provided as required by the functional program.

8.11 Linen Services

8.11.A. General
Each facility shall have provisions for storing and processing of clean and soiled/contaminated linen for ~~appropriate~~ resident care. Processing may be done within the facility, in a separate building on- or off-site, or in a commercial or shared laundry. At a minimum, the following elements shall be included:

1. Separate central or decentralized room(s) for receiving and holding soiled linen ~~until ready~~ for pickup or processing. Such room(s) shall have proper ventilation and exhaust.

2. A central, clean linen storage and issuing room(s), in addition to the linen storage required at individual resident units.

3. Provisions~~ shall be made~~ for parking of clean and soiled linen carts separately and out of traffic and for cleaning of linen carts on premises (or exchange of carts off premises).

4. Handwashing stations in each area where unbagged, soiled linen is handled.

8.11.B. Off-Site Processing
If linen is processed off-site or in a separate building on-site, the following shall be provided~~provisions shall also be made for~~:

1. A service entrance, protected from inclement weather, for loading and unloading of linen. This can be shared with other services and serve as the loading dock for the facility.

2. Control station for pickup and receiving. This can be shared with other services and serve as the receiving and pickup point for the facility.

8.11.C. On-Site Processing
If linen is processed in a laundry facility within the facility, the following shall be provided:

1. A receiving, holding, and sorting room for control and distribution of soiled linen. Discharge from soiled linen chutes may be received within this room or in a separate room adjacent to it.

2. Washers/extractors located between the soiled linen receiving and clean processing areas. Personal laundry, if decentralized, may be handled within one room or rooms, so long as there are separate, defined areas for handling clean and soiled laundry.

3. Storage for laundry supplies.

4. Linen inspection and mending area.

5. Arrangement of equipment that will permit an orderly work flow and minimize cross-traffic that might mix clean and soiled operations.

8.12 Housekeeping Rooms

Housekeeping rooms shall be provided throughout the facility as required to maintain a clean and sanitary environment. Each shall contain a floor receptor or service sink and storage space for housekeeping equipment and supplies. ~~There shall be a~~At least one housekeeping room shall be provided for each floor.

8.13 Engineering Service and Equipment Areas

The following shall be provided as necessary for effective service and maintenance functions:

8.13.A.
Room(s) or separate building(s) for boilers, mechanical, and electrical equipment.

8.13.B.
Provisions for protected storage of facility drawings, records, manuals, etc.

8.13.C.
General maintenance area for repair and maintenance.

8.13.D.
Storage ~~R~~room for ~~B~~building ~~M~~maintenance ~~S~~supplies.
Storage for solvents and flammable liquids shall comply with applicable NFPA codes.

8.13.E.
Yard equipment and supply storage areas, ~~shall be~~ located so that equipment may be moved directly to the exterior.

8.13.F.
Loading dock~~,~~ and receiving and breakout area(s), if required by the functional program. These may be shared with other services.

8.13.G.
General storage space(s) ~~shall be provided~~ for furniture and equipment such as intravenous stands, inhalators, air mattresses, walkers, ~~etc.,~~ medical supplies, and housekeeping supplies and equipment.

*8.14 General Standards for Details and Finishes

Resident facilities require features that encourage ambulation of long-term residents. Signage and wayfinding features shall be provided to aid self-ambulating residents and avoid confusing or disorienting them. Potential hazards to residents, such as sharp corners, slippery floors, loose carpets, and hot surfaces ~~should~~ **shall** be avoided.

Renovations shall not diminish the level of compliance with these standards below that which existed prior to the renovation. However, features in excess of those for new constructions are not required to be maintained in the completed renovation.

8.14.A. Details

8.14.A1. The placement of drinking fountains, public telephones, and vending machines shall not restrict corridor traffic or reduce the corridor width below the minimum stipulated in NFPA 101.

8.14.A2. Doors to all rooms containing bathtubs, sitz baths, showers, and toilets for resident use shall be hinged, sliding, or folding.

8.14.A3. Windows and outer doors that may be left open shall have insect screens.

8.14.A4. Resident rooms or suites in new construction shall have window(s). Operable windows or vents that open from the inside shall be restricted to inhibit possible resident escape or suicide. Windows shall have sills located above grade, but no higher than 36 inches (914.4 millimeters) above the finished floor.

***8.14.A5.** Glazing in doors, sidelights, borrowed lights, and windows where glazing is less than 18 inches (457.2 millimeters) from the floor shall be constructed of safety glass, wire glass, tempered glass, or plastic glazing material that resists breaking and creates no dangerous cutting edges when broken. Similar materials shall be used in wall openings in activity areas (such as recreation rooms and exercise rooms) if permitted by local requirements. If doors are provided for shower and tub enclosures, glazing shall be safety glass or plastic.

8.14.A6. Thresholds and expansion joint covers shall be designed to facilitate use of wheelchairs and carts and to prevent tripping.

***8.14.A7.** Grab bars shall be installed in all resident toilets, showers, tubs, and sitz baths. For wall-mounted grab bars, a minimum 1-1/2-inch (38.1 millimeters) clearance from walls shall be provided~~is required~~. Bars, including those which are part of fixtures such as soap dishes, shall have the strength to sustain a concentrated load of 250 pounds (113.4 kilograms). Toilets ~~utilized~~ used by residents shall be provided sufficient clearance on both sides of the water closet to enable physical access and maneuvering by staff, who may have to assist the resident in wheelchair-to-water-closet transfers and return. When independent transfers are feasible, alternative grab bar configurations shall be permitted.

***8.14.A8.** Where corridors are defined by walls, handrails shall be provided on both sides of all corridors normally used by residents. A minimum clearance of 1-1/2 inches (38.1 millimeters) shall be provided between the handrail and the wall. Rail ends shall be returned to the wall or floor~~finished to minimize potential for personal injury~~.

8.14.A9. Handwashing stations shall be constructed with sufficient clearance for blade-type operating handles.

8.14.A10. Lavatories, ~~and~~ handwashing stations, and handrails ~~which~~ that a resident could use for support shall be securely anchored.

8.14.A11. Each resident handwashing station shall have a mirror. Mirror placement shall allow for convenient use by both wheelchair occupants and~~/or~~ ambulatory persons. Tops and bottoms may be at levels usable by individuals either sitting or standing, or additional mirrors may be provided for wheelchair occupants. One separate full-length mirror may serve for wheelchair occupants.

8.14.A12. Provisions for hand drying shall be included at all handwashing stations. These shall be paper or cloth towels enclosed to protect against dust or soil and to ensure single-unit dispensing.

8.14.A13. The minimum ceiling height shall be 7 feet 10 inches (2.39 meters), with the following exceptions:

a. Boiler rooms shall have ceiling clearances of at least 2 feet 6 inches (762 millimeters) above the main boiler header and connecting pipe.

b. Rooms containing ceiling-mounted equipment shall have the required ceiling height to ensure proper functioning of that equipment.

c. Ceilings in corridors, storage rooms, and toilet rooms shall be at least 7 feet 8 inches (2.34 meters). Ceilings in normally unoccupied spaces may be reduced to 7 feet (2.13 meters).

d. Building components and suspended tracks, rails, and pipes located along the path of normal traffic shall be not less than 7 feet (2.13 meters) above the floor.

e. In ~~buildings being~~ renovation projects~~ed~~, all new work shall comply, insofar as practical, ~~it is desirable to maintain minimum ceiling heights per~~with subparagraphs a through d above. Where existing conditions make compliance impractical or impossible, exceptions should be considered. However, in no case shall ceiling heights be reduced more than 4 inches (25.4 millimeters) below the minimum requirement for new construction.

f. Architecturally framed and trimmed openings in corridors and rooms shall be permitted, provided a minimum clear opening height of 7 feet (2.13 meters) is maintained.

8.14.A14. Rooms containing heat-producing equipment (such as boiler rooms, heater rooms, and laundries) shall be insulated and ventilated to prevent the floors of occupied areas overhead and the adjacent walls from exceeding a temperature of 10°F (6°C) above the ambient room temperature of such occupied areas.

8.15 Finishes

8.15.A.
Cubicle curtains and draperies shall be noncombustible or flame-retardant as prescribed in both the large- and small-scale tests in NFPA 701.

8.15.B.
Materials provided ~~by the facility~~ for finishes and furnishings, including mattresses and upholstery, shall comply with NFPA 101.

8.15.C.
Floor materials shall be readily cleanable and appropriate for the location. Floors in areas used for food preparation and assembly shall be water-resistant. Floor surfaces, including tile joints, shall be resistant to food acids. In all areas subject to frequent wet-cleaning methods, floor materials shall not be physically affected by germicidal cleaning solutions. Floors subject to traffic while wet (such as shower and bath areas, kitchens, and similar work areas) shall have a slip-resistant surface. Carpet and padding in resident areas shall be glued down or stretched taut and free of loose edges or wrinkles that might create hazards or interfere with the operation of wheelchairs, walkers, wheeled carts, etc.

8.15.D.
Wall bases in areas subject to routine wet cleaning shall be coved and tightly sealed.

8.15.E.
Wall finishes shall be washable and, if near plumbing fixtures, shall be smooth and moisture-resistant. Finish, trim, walls, and floor constructions in dietary and food storage areas shall be free from rodent- and

insect-harboring spaces.

8.15.F.
Floor and wall openings for pipes, ducts, and conduits shall be tightly sealed to resist fire and smoke and to minimize entry of pests. Joints of structural elements shall be similarly sealed.

8.15.G.
The finishes of all exposed ceilings and ceiling structures in resident rooms and staff work areas shall be readily cleanable with routine housekeeping equipment. Finished ceilings shall be provided in dietary and other areas where dust fallout might create a problem.

8.15.H.
Directional and identification signage shall comply with Americans with Disabilities Act (ADA) guidelines.

8.16 Construction Features

All parts of the nursing facility shall be designed and constructed to sustain dead and live loads in accordance with local and national building codes and accepted engineering practices and standards, including requirements for seismic forces and applicable sections of NFPA 101.

8.17-8.29 Reserved

8.30 Special Systems

8.30.A. General

8.30.A1. Prior to acceptance of the facility, all special systems shall be tested and operated to demonstrate to the owner or designated representative that the installation and performance of these systems conform to design intent. Test results shall be documented for maintenance files.

8.30.A2. Upon completion of the special systems equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions, a parts list, and complete procurement information, including equipment numbers and descriptions. Operating staff ~~persons~~ shall also be provided with instructions for proper operation of systems and equipment. Required information shall include all safety or code ratings as needed.

8.30.A3. Insulation shall be provided surrounding special system equipment to conserve energy, protect personnel, and reduce noise.

8.30.B. Elevators

8.30.B1. All buildings having resident use areas on more than one floor shall have electric or hydraulic elevator(s). Installation and testing of elevators shall comply with ANSI/ASME A17.1 (for new construction) or ANSI/ASME 17.3 (for existing buildings). (See ASCE 7-93 for seismic design and control systems requirements for elevators.)

~~a.~~ Engineered traffic studies are recommended, but in their absence the following guidelines for minimum number of elevators shall apply (**Note**: these standards may be inadequate for moving large numbers of people in a short time; adjustments should be made as appropriate):

~~b~~a. At least one elevator sized to accommodate a bed, gurney, and/or medical carts and wheelchair users shall be installed where residents are housed on any floor other than the main entrance floor.

~~c~~b. ~~When~~ Where 60 to 200 residents are housed on floors other than the main entrance floor, at least two elevators, one of which shall be of the hospital type, shall be installed.

~~d~~c. ~~When~~ Where 201 to 350 residents are housed on floors other than main entrance floor, at least three elevators, one of which shall be of the hospital type, shall be installed.

~~e~~d. For facilities with more than 350 residents housed above the main entrance floor, the number of elevators shall be determined from a facility plan study and from the estimated vertical transportation requirements.

~~f~~e. When the nursing facility is part of a general hospital, elevators may be shared and the standards of Section 7.30 shall apply.

***8.30.B2.** Cars of hospital-type elevators shall have inside dimensions that accommodate a resident bed with attendants. The clear inside dimension of such cars shall be at least 5 feet 4 inches (~~1.52~~ 1.62 meters) wide by ~~7~~8 feet ~~6~~5 inches (~~2.29~~ 2.43 meters) deep. Car doors shall have a clear opening of not less than 3 feet 8 inches (1.12 meters). Other elevators required for passenger service shall be constructed to accommodate wheelchairs.

8.30.B3. Elevators shall be equipped with an automatic two-way leveling device with an accuracy of ±1/4 inch (7 millimeters).

8.30.B4. Elevators shall have handrails on all sides without entrance door(s).

8.30.C. Waste Processing Service

Facilities shall be provided for sanitary storage and treatment or disposal of waste and recyclables using techniques and capacities acceptable to the appropriate health and environmental authorities.

8.31 Mechanical Standards

8.31.A. General

8.31.A1. The mechanical system shall be subject to general review for operational efficiency and appropriate life-cycle cost. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually. Recognized engineering procedures shall be followed for the most economical and effective results. A well-designed system can generally achieve energy efficiency with minimal additional cost and simultaneously provide improved resident comfort. In no case shall resident care or safety be sacrificed for conservation.

8.31.A2. Facility design consideration shall include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.~~Facility design considerations shall include site, building, location, climate, orientation, configuration, and thermal requirements.~~

8.31.A3. As appropriate, controls for air-handling systems shall be designed with an economizer cycle to use outside air for cooling and/or heating.

8.31.A4. To maintain asepsis control, airflow supply and exhaust should generally be controlled to ensure movement of air from "clean" to "less clean" areas.

8.31.A5. Supply and return mains and risers for cooling, heating, and steam systems shall be equipped with valves to isolate the various sections of each system. Each piece of equipment shall have valves at the supply and return ends.

8.31.B. Thermal and Acoustical Insulation

8.31.B1. Insulation within the building shall be provided to conserve energy, protect personnel, prevent vapor condensation, and reduce noise.

8.31.B2. Insulation on cold surfaces shall include an exterior vapor barrier. (Insulating material that will not absorb or transmit moisture will not require a separate vapor barrier.)

8.31.B3. Insulation, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less as determined by an independent testing laboratory in accordance with NFPA 255.

8.31.B4. If duct lining is used, it shall be coated and sealed and shall meet ASTM C1071. These linings (including coatings, adhesives, and exterior surface insulation of pipes and ducts in spaces used as air supply plenums) shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as determined by an independent testing laboratory in accordance with NFPA 255. Duct lining ~~may~~ shall not be installed within 15 feet (4.57 meters) downstream of humidifiers.

8.31.B5. In facilities undergoing major renovations, existing accessible insulation shall be inspected, repaired, and/or replaced as appropriate.

8.31.C. Steam and Hot Water Systems

8.31.C1. Boilers shall have the capacity, based on the net ratings published by the Hydronics Institute or another acceptable national standard, to supply not less than 70 percent of the normal requirements of all systems and equipment. Their number and arrangement shall accommodate facility needs despite the breakdown or routine maintenance of any one boiler. The capacity of the remaining boiler(s) shall be sufficient to provide hot water service for clinical, dietary, and resident use; steam for dietary purposes; and heating for general resident rooms. However, reserve capacity for facility space heating is not required in geographic areas where a design dry-bulb temperature of 25°F (-4°C) or more represents not less than 99 percent of the total hours in any one heating month, as noted in ASHRAE's *Handbook of Fundamentals*, under the "Table for Climatic Conditions for the United States."

8.31.C2. Boiler accessories, including feed pumps, heat-circulating pumps, condensate return pumps, fuel oil pumps, and waste heat boilers, shall be connected and installed to provide both normal and standby service.

8.31.D. ~~Air Conditioning,~~ Heating, ~~and~~ Ventilation, and Air Conditioning Systems

***8.31.D1.** The ventilation rates shown in Table 8.1, as applicable, shall be used only as minimum standards; they do not preclude the use of higher rates as appropriate. All rooms and areas in the facility shall have provision for positive ventilation. Space temperature and relative humidity shall be as indicated in Table 7.2. ~~T~~Although natural window ventilation may be utilized ~~where~~ when weather and outside air quality permit, ~~use of~~ mechanical ventilation ~~should~~ shall be ~~considered~~ provided for all rooms and ~~interior~~ areas in the facility~~and during periods of temperature extremes~~. Non-central air-handling systems~~,~~ (e.g., through-the-wall fan coil units)~~,~~ may be utilized. Fans serving exhaust systems shall be located at the discharge end and shall be readily serviceable. Exhaust systems may be combined to enhance the efficiency of recovery devices required for energy conservation.

For renovation projects, prior to the start of construction, and preferrably during the design, airflow and static pressure measurements shall be taken at the connection points of new ductwork to existing systems. This information shall be used by the designer to determine if existing systems have sufficient capacity for the intended new purposes, and for any required modifications to the existing system to be included in the design documentation. Exhaust hoods handling grease-laden vapors in food preparation centers should comply with NFPA 96. All hoods over cooking ranges should be equipped with grease filters, fire-extinguishing systems, and heat-actuated fan controls. Cleanout openings should be provided every 20 feet (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. (Horizontal runs of ducts serving range hoods should be kept to a minimum.)

8.31.D2. When appropriate, mechanical ventilation should employ an economizer cycle that uses outside air to reduce heating-and-cooling-system loads. Filtering will be necessary when outside air is used as part of the mechanical ventilation system. Innovative design that provides for additional energy conservation while meeting the intent of these standards for acceptable resident care should be considered.

8.31.D3. Fresh air intakes shall be located at least 25 feet (7.62 meters) from exhaust outlets of ventilating systems, combustion equipment stacks, medical-surgical vacuum systems, plumbing vents, or areas that may collect vehicular exhaust or other noxious fumes. (Prevailing winds and/or proximity to

other structures may require greater clearances.) The bottom of outdoor air intakes serving central ventilating systems shall be as high as practical, but at least 6 feet (1.83 meters) above ground level, or, if installed above roof, 3 feet (0.91 meter) above roof level. Exhaust outlets from areas that may be contaminated shall be above roof level, arranged to minimize recirculation of exhaust air into the building.

8.31.D4. The ventilation systems shall be designed and balanced to provide directional flow as shown in Table 8.1.

8.31.D5. All central ventilation or air conditioning systems shall be equipped with filters with efficiencies equal to, or greater than, those specified in Table 8.2. Filter efficiencies, tested in accordance with ASHRAE Standard 52-92, shall be average. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing ductwork. All joints between filter segments and the enclosing ductwork shall have gaskets or seals to provide a positive seal against air leakage. Provisions shall be made to allow access for field testing.

8.31.D6. Air-handling duct systems shall meet the requirements of NFPA 90A and those contained herein.

8.31.D7. Fire and smoke dampers shall be constructed, located, and installed in accordance with the requirements of NFPA 101, 90A, and the specific damper's listing requirements. Fans, dampers, and detectors shall be interconnected so that damper activation will not damage ducts. Maintenance access shall be provided at all dampers. All damper locations ~~should~~ shall be shown on drawings. Dampers ~~should~~ shall be activated by fire or smoke sensor, not by fan cutoff alone.

Switching systems for restarting fans may be installed for fire department use in evacuating smoke after a fire has been controlled. However, provisions ~~should~~ shall be made to avoid possible damage to the system because of closed dampers.

When smoke partitions are required, heating, ventilating, and air conditioning zones shall be coordinated with compartmentation insofar as practical to minimize the need to penetrate fire and smoke partitions.

***8.31.D8.** ~~Non-central air-handling systems, e.g., through-the-wall fan coil units, shall be equipped with permanent (cleanable) or replaceable filters rated at a minimum efficiency of 68 percent arrestance per ASHRAE Test Methods Standard 52.1-92.~~ Noncentral air-handling systems (i.e., individual room units that are used for heating and cooling purposes) (fan-coil units, heat pump units, etc.) shall be equipped with permanent (cleanable) or replaceable filters. These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air-handling system with the proper filtration, as noted in Table 8.2.

8.31.D9. Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit workstation temperatures.

8.31.E. Plumbing and Other Piping Systems
Unless otherwise specified herein, all plumbing systems shall be designed and installed in accordance with the *National Standard Plumbing Code*, chapter 14, Medical Care Facility Plumbing Equipment.

8.31.E1. The following standards shall apply to plumbing fixtures:

a. The material used for plumbing fixtures shall be nonabsorptive.

b. Water spouts used in lavatories and sinks shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc.

c. All fixtures used by staff and all lavatories used by food handlers shall be trimmed with valves that can be operated without hands (single-lever devices may be used). Blade handles used for this purpose shall not exceed 4-1/2 inches (114.3 millimeters) in length. Handles on scrub sinks and clinical sinks shall be at least 6 inches (152.4 millimeters) long.

d. Clinical sinks shall have an integral trap wherein the upper portion of the water trap provides a visible seal.

e. Showers and tubs shall have a slip-resistant surface.

8.31.E2. The following standards shall apply to potable water supply systems:

a. Systems shall be designed to supply water at sufficient pressure to operate all fixtures and equipment during maximum demand. Supply capacity for hot- and cold-water piping shall be determined on the basis of fixture units, using recognized engineering standards. When the ratio of plumbing fixtures to occupants is proportionally more than required by the building occupancy and is in excess of 1,000 plumbing fixture units, a diversity factor is permitted.

b. Each water service main, branch main, riser, and branch to a group of fixtures shall have valves. Stop valves shall be provided for each fixture. Appropriate panels for access shall be provided at all valves where required.

c. Vacuum breakers or ~~B~~backflow prevention devices ~~ers (vacuum breakers)~~ shall be installed on hose bib~~b~~s and supply nozzles used for connection of hoses or tubing in housekeeping sinks, bedpan-flushing attachments, etc.

d. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.

e. Systems shall be protected against cross-connection in accordance with American Water Works Association (AWWA) Recommended Practice for Backflow Prevention and Cross-connection Control.

8.31.E3. The following standards shall apply to hot water systems:

a. The water-heating system shall have sufficient supply capacity at the temperatures and amounts indicated in Table 8.3. Water temperature is measured at the point of use or inlet to the equipment. Water shall be permitted to be stored at higher temperatures.

b. Hot-water distribution systems serving resident care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet. Non-recirculated fixture branch piping shall not

exceed 25 feet (7.62 meters) in length.

*c. Provisions shall be included in the domestic hot water system to limit the amount of *Legionella* bacteria and opportunistic water–borne pathogens.

d. Dead-end piping (risers with no flow, branches with no fixture) shall not be installed. In renovation projects, dead-end piping shall be removed. Empty risers, mains, and branches installed for future use shall be permitted.

8.31.E4. The following standards shall apply to drainage systems:

a. Insofar as possible, drainage piping shall not be installed within the ceiling or exposed in food preparation centers, food serving facilities, food storage areas, central services, electronic data processing areas, electric closets, and other sensitive areas. Where exposed overhead drain piping in these areas is unavoidable, special provisions shall be made to protect the space below from leakage, condensation, or dust particles.

b. Building sewers shall discharge into community sewerage. Where such a system is not available, the facility shall treat its sewage in accordance with local and state regulations.

c. Kitchen grease traps shall be located and arranged to permit easy access.

8.31.E5. Any installation of nonflammable medical gas, air, or clinical vacuum systems shall comply with the requirements of NFPA 99. When any piping or supply of medical gases is installed, altered, or augmented, the altered zone shall be tested and certified as required by NFPA 99.

8.31.E6. All piping, except control-line tubing, shall be identified. All valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.

8.32 Electrical Standards

8.32.A. General

~~**8.32.A1.** All material and equipment, including conductors, controls, and signaling devices, shall be installed to provide a complete electrical system in accordance with NFPA 70 and NFPA 99.~~

~~**8.32.A2.** All electrical installations and systems shall be tested to verify that the equipment has been installed and that it operates as designed.~~

~~**8.32.A3.** Electrical systems for nursing facilities shall comply with applicable sections of NFPA 70.~~

~~**8.32.A4.** Lighting shall be engineered to the specific application.~~

~~*a. The Illuminating Engineering Society of North America (IES) has developed recommended minimum lighting levels for nursing facilities.~~

~~*b. Approaches to buildings and parking lots, and all occupied spaces within buildings shall have fixtures for lighting. Consideration shall be given to contrast in lighting levels.~~

~~*c. Resident rooms shall have general lighting and night lighting. A reading light shall be provided for each resident. Reading light controls shall be readily accessible to residents. At least one night light fixture in each resident room shall be controlled at the room entrance. All light controls in resident areas shall be quiet operating.~~

~~d. Resident unit corridors shall have general illumination with provisions for reducing light levels at night.~~
8.32.A4. Lighting shall be engineered to the specific application. Unless alternative lighting levels are justified by the approved functional program, Table 8.4 shall be used as a guide to minimum required ambient and task lighting levels in all rooms, spaces and exterior walkways.

*a. The Illuminating Engineering Society of North America (IESNA) has developed recommended lighting design practices, including minimum lighting levels for nursing facilities and other senior living environments, which in 2001 were adopted as an ANSI standard.

*b. Approaches to buildings and parking lots, and all occupied spaces within buildings, shall have fixtures for lighting. Consideration shall be given to both the quantity and quality of lighting, including contrast in lighting levels, glare control, the special lighting needs of the elderly, area-specific lighting solutions, the use of daylighting, the life cycle costs of lighting, and other lighting design practices as defined and described in ANSI/IESNA RP-28-01.

*c. Resident rooms and toilet rooms shall have general lighting, task lighting, and night lighting. At least one task light shall be provided for each resident. Task light controls shall be readily accessible to residents. At least one low-level night light fixture in each room shall be located close to the floor and controlled at the room entrance. When the approved functional program stipulates staff shall use portable light sources, flexibility may be permitted to omit night lights in resident rooms. All light controls in resident areas shall be quiet-operating.

d. Resident unit corridors shall have general illumination with provisions for reducing light levels at night. Corridors and common areas used by residents shall have even light distribution to avoid glare, shadows and scalloped lighting effects. Highly reflective floors shall be avoided.

8.32.A5. Receptacles (convenience outlets) shall be provided as follows:

a. Each resident room shall have duplex-grounded receptacles. There shall be one at each side of the head of each bed and one on every other wall. Receptacles may be omitted from exterior walls where construction makes installation impractical.

b. Duplex-grounded receptacles for general use shall be installed approximately 50 feet (15.24 meters) apart in all corridors and within 25 feet (7.62 meters) of corridor ends.

c. Electrical receptacle coverplates or electrical receptacles supplied from the emergency system shall be distinctively colored or marked for identification. If color is used for identification purposes, the same color ~~should~~ shall be used throughout the facility.

d. Ground~~-~~ fault~~-~~ interrupters shall comply with NFPA 70.

8.32.B.-8.32.F Reserved

8.32.G. Nurse/Staff Call System
A nurse/staff call system shall be provided. Each bed location and/or resident shall be provided with a call device. Two call devices serving adjacent beds or residents may be served by one calling station. Calls shall be initiated by a resident activating either a call device attached to a resident's calling station~~,~~ or a portable device ~~which~~ that sends a call signal to the calling station and shall either:

~~(a)~~1. Activate a visual signal in the corridor at the resident's door or other appropriate location. In multi-corridor or cluster resident units, additional visual signals shall be installed at corridor intersections; or

~~(b)~~2. Activate a pager worn by a staff member, identifying the specific resident and/or room from which the call has been placed.

An emergency call system shall be provided at each resident toilet, bath, sitz bath, and shower room. This system shall be accessible to a resident lying on the floor. Inclusion of a pull cord or portable radio frequency pushbutton will satisfy this standard.

The emergency call system shall be designed so that a call activated by a resident will initiate a signal distinct from the regular staff call system and that can be turned off only at the resident's location. The signal shall activate an annunciator panel or screen at the staff work area or other appropriate location, and at other areas defined by the functional program, and either a visual signal in the corridor at the resident's door or other appropriate location, or a staff pager indicating the calling resident's name and/or room location~~, and at other areas defined by the functional program~~.

Alternate technologies ~~can~~ may be considered for emergency or nurse call systems. If radio frequency systems are used, consideration should **[shall?]** be given to electromagnetic compatibility between internal and external sources.

8.32.H. Emergency Electrical Service

8.32.H1. ~~As~~ At a minimum, nursing facilities or sections thereof shall have emergency electrical systems as required in NFPA 101 and Chapter 16, Nursing Home Requirements, of NFPA 99.

8.32.H2. When the nursing facility is a distinct part of an acute-care hospital, it may use the emergency generator system for required emergency lighting and power, if such sharing does not reduce hospital services. Life support systems and their respective areas shall be subject to applicable standards of Section 7.3~~2~~5.

8.32.H3. An emergency electrical source shall provide lighting and/or power during an interruption of the normal electric supply. Where stored fuel is required, storage capacity shall permit continuous operation for at least 24 hours. Fuel storage for electricity generation shall be separate from heating fuels. If the use of heating fuel for diesel engines is considered after the required 24-hour supply has been exhausted,

positive valving and filtration shall be provided to avoid entry of water and/or contaminants.

8.32.H4. A minimum of one dedicated essential system circuit per bed for ventilator-dependent patients ~~is required~~shall be provided in addition to the normal system receptacle at each bed location required by NFPA 70. This circuit shall be provided with a minimum of two duplex receptacles identified for emergency use. Additional essential system circuits/receptacles shall be provided where the electrical life support needs of the patient exceed the minimum requirements stated in this paragraph. This paragraph shall apply to both new and existing facilities serving ventilator-dependent patients.

8.32.H5. Heating equipment provided for ventilator-dependent patient bedrooms shall be connected to the essential electrical system. This paragraph shall apply to both new and existing facilities.

8.32.H6. Task lighting connected to the essential electrical system shall be provided for each ventilator-dependent patient bedroom. This paragraph shall apply to both new and existing facilities.

8.32.H7. Exhaust systems (including locations, mufflers, and vibration isolators) for internal combustion engines shall be designed and installed to minimize objectionable noise. Where a generator is routinely used to reduce peak loads, protection of patient areas from excessive noise may become a critical issue.

8.32.I. Fire Alarm System

Fire alarm and detection systems shall be provided in compliance with NFPA 101 and NFPA 72

8.32.J. Telecommunication and Information Systems

8.32.J1. Locations for terminating telecommunications and information system devices shall be provided.

8.32.J2. A space shall be provided for central equipment locations. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

A8.1.A Specific requirements for each of the special care facility types are addressed in the paragraphs noted. For basic requirements, see chapters 1 through 6. For requirements regarding swing beds see Section 7.1.E. Related sections include the following: ~~c~~Chapter 13 for hospice care; chapter 14 for assisted living; and chapter 15 for adult day care.

A8.2.A. Clusters and Staffing Considerations

Clustering refers to several concepts wherein the design of traditional nursing home floor plans (straight halls, double- or single-~~-~~loaded corridors) is reorganized to provide benefits to both residents and to the effectiveness with which people care for them.

Clustering is done to achieve better image, faster service, shorter walking/wheeling distances, and more subtle handling of linen. It can also afford more localized social areas and optional decentralized staff work areas. A functioning cluster as described here is more than an architectural form where rooms are grouped around social areas without reference to caregiving. In a functioning cluster, the following will be accomplished:

Utility placement is better distributed for morning care: Clean and soiled linen rooms are located closer to the resident rooms, minimizing staff steps and maximizing the appearance of corridors (carts are not scattered through halls).

Unit scale and appearance reinforces smaller groups of rooms seen as being grouped or related: Clusters should offer identifiable social groups for both staff and older people, thereby reducing the sense of largeness often associated with centralized facilities.

Geographically effective staffing: The staffing pattern and design reinforce each other so that nursing assistants can offer primary nursing care and relate to a given set of rooms. Their room assignments are grouped together and generally do not require unequal travel distances to basic utilities. Staff "buddying" is possible. Buddying involves sharing responsibilities such as lifting a non-weight-~~-~~bearing person~~,~~ or covering for someone while the buddy provides off-unit transport~~,~~ or is on a break.

Staffing that works as well at night as during the day: An effective cluster design incorporates multiple staffing ratios. A unit might have 42 beds, but with clustering, could staff effectively in various ratios of licensed nurses to nurses assistants: 1:7 days (~~6~~six clusters); 1:14 or 1:21 nights (~~3~~ three or ~~2~~ two neighborhoods).

Clustering can also have some other benefits:

Cluster design can provide more efficient "gross/net area" when a variety of single and/or double rooms are "nested."

Cluster design can be useful when a project is to have a high proportion of private occupancy rooms, because it reduces distances to staff work areas or nursing stations.

Clusters provide a method of distributing nursing staff through a building, nearer to bedrooms at night, so they can be responsive to vocal calls for assistance and toileting. (Central placement of staff requires

greater skill in using traditional call systems than many residents possess.)

Cluster units of a given size may "stack" or be placed over each other, but might have different staffing for varying care levels.

If digital call systems are used (such as those allowing reprogramming of what room reports to which zone or nursing assistant's work area), then one unit might easily be changed over time, such as when client needs justify higher ratios of nursing assistants to older people. For example, a 48-bed unit might start at 1:8 staffing but also respond to 1:6 staffing needs. In some units, staffing might also be slightly uneven, such as where 60-bed units are comprised of clusters of 1:7 and 1:8 during days.

Architectural ~~F~~form and ~~C~~clustering: Clusters involve architectural form and may have an impact on overall building shape. The longer length of stay of nursing home residents compared with hospital clients is one factor that makes clustering rooms in more residential groups particularly appropriate. However, the visual advantages of units without long corridors has also attracted hospital planners. In both facility types, architectural clustering may help both staff and residents socially identify a space or sub-unit within a larger unit.

Though architectural clustering may involve grouping rooms, this should not ~~happen at the expense of~~ result in windowless social areas, or the incorporation of all social options in a windowless social area directly outside of the bedroom doorways.

A8.2.B1. Changes to the maximum number of residents per room may be made upon a determination by the authority having jurisdiction that such an alternate room configuration provides a preferable ~~resident~~ environment for residents with unusual care requirements. Single resident rooms with an individual toilet room are encouraged. In two-bed rooms, consideration should be given to creating room configurations that maximize individual resident privacy, access to windows, room controls, and equivalent space.

A8.2.B2. For purposes of planning minimum clearances around beds, unless specified otherwise by the Functional Program, the rectangular dimensions to be utilized are width: 40 inches (1.01 meters) and length: 96 inches (2.43 meters).

A8.2.B5. While ADAAG, UFAS, and ANSI accessibility standards were all developed with the intention of providing greater access for individuals with disabilities, their standards are based upon assumed stature and strength, whereby dimensional and grab bar requirements are intended to facilitate wheelchair-to-toilet transfers by individuals with sufficient upper body strength and mobility to effect such a transfer. The typical nursing home resident is unlikely to have such capabilities, thus requiring the assistance of one or more staff. Insufficient clearance at the side of the toilet can restrict staff mobility and access, and can result in injury. There are ongoing efforts aimed at educating regulators and advisory panels to the difficulties ~~encountered~~ caused by inappropriate standards required within environments serving frail and geriatric populations.

Alternative grab bar configurations should address the following scenarios:

a. When a resident is capable of independent transfer facilitated by the grab bar and side-wall location required by accessibility standards, a removable/temporary wall structure and grab bar can be installed

alongside the toilet.

b. When a resident requires partial assistance in transfer, fold-down grab bars on one or both sides of the toilet would facilitate such transfers.

A8.2.C1. Whether centralized or decentralized, staff work areas should be designed to minimize the institutional character, command-station appearance, and noise associated with traditional medical nursing stations, and should foster close, open relationships between residents and staff. Confidentiality or noisy staff conversations should be accommodated in an enclosed staff lounge and/or conference area. At least part of each staff work area should be low enough and open enough to permit easy conversations between staff and residents seated in wheelchairs.

Depending upon the type of service and care plan to be provided, direct care staff work areas need not be encumbered with all of the provisions for a supervisory administrative staff work area. In some decentralized arrangements, caregiving functions may be accommodated at a piece of residential furniture (such as a table or a desk) or at a work counter recessed into an alcove off a corridor or activity space, with or without computer and communications equipment, storage facilities, etc.

A8.2.C11. Consideration should be given to privacy when locating the entrance to the bathing room.

A8.3.A.
While the guidelines provide a minimum requirement of 20 square feet (1.85 square meters) per bed for dining space, it is likely that facilities designed to this standard will be required to serve the resident population in more than one shift. In practice, the dining room should be sized at a minimum of 28 net square feet (2.60 square meters) per resident seated at one time. It is important to provide outdoor views from dining, recreation, and living spaces.

A8.4.
Activities programs focus on the social, spiritual, and creative needs of residents and clients and provide quality, meaningful experiences for them. These programs may be facility-wide or for smaller groups.

If included in the functional program, the ~~A~~activities department is generally responsible for coordination of activities for large groups, as well as small groups and personalized individual programs involving one resident and one therapist. These activities may be conducted in other portions of the building (i.e., dining rooms, recreation spaces, lounges, etc.), but dedicated spaces are preferred for efficient operation of quality programs. Large space requirements (e.g., libraries, chapels, auditoriums, and conference, classroom, and/or training spaces) are ~~incumbent~~ dependent upon the programming decisions of the sponsors as reflected in the functional program for the facility.

A8.4.B1. If required by the functional program, include space for files, records, computers, and administrative activities; a storage space for supplies and equipment; and a quiet space for residents to maximize conversations. This quiet space may be incorporated within space for administrative activities.

Note: Hearing loss in the elderly is well documented. Quiet space is very important to enable conversation.

A8.6.
Consideration should be given to the special ventilation and exhaust requirements of these areas.

A8.7
Since subacute care comprises programs in various settings, the design of such units/facilities should focus on two major components:

a. The unit/facility should comply with all applicable nursing home requirements contained in this chapter, to the extent that they do not conflict with the clinical program.

b. The facility/unit should comply with the requirements dictated by the functional program required by Section 1.1.F~~ of these Guidelines~~.

A8.8.A.
The latest edition of the Life Safety Code recognizes the need to lock doors in Alzheimer's units. Consideration should be given to making locks on wardrobes, closets, or cupboards inconspicuous.

A8.8.B.
Outdoor spaces may include gardens on grade or on roof decks, or solaria, porches, balconies, etc. Lounge space may be a winterized sun room, a designated lounge space separate from the dining room, or a day room, where other residents may be sitting. Secure, accessible outdoor space can provide a calming change in environment and also a convenient place for agitated residents to walk.

A8.8.C.
Major characteristics of persons with Alzheimer's and other dementias are lack of attention span and an inability to orient themselves within space. The environment should provide attention-grabbing landmarks and wayfinding cues and information to aid in navigation from point to point. Sensory cuing that is used in other long-term care resident areas should be incorporated for persons with dementia. Dementia program activities may include memory stimulation, music therapy, art therapy, horticultural therapy, etc. Space for dining and activities in dedicated dementia units may be provided within the unit, or directly accessible to the residents of the unit, per the minimum standards described elsewhere in Chapter 8. Consideration should be given to:

a. Landmarks. Design elements that provide clear reference points in the environment~~,~~ (e.g.~~i.e.~~, a room, a large three-dimensional object, large picture, or other wall-mounted artifact).

b. Signs. When appropriate, large characters and redundant word/picture combinations should be used on signs.

c. Environmental design challenge. Residents with mental impairment often find it difficult to sit for long periods of time or to sit at all without becoming restless. Although it is not a universal trait, it is so common and requires so much staff time that environmental solutions should be explored in all areas, to give cognitively impaired people interesting places and things on which to focus their attention.

A8.14.
Hot surfaces are intended to include those surfaces to which residents have normal access that exceed

110°F (43°C). This requirement does not ~~intend to include~~extend to medical or therapeutic equipment.

A8.14.A5. Where local requirements permit, wire-free, fire-rated safety glazing should be used to enhance the home-like residential appearance preferred by residents and visitors.

A8.14.A7. Consideration should be given to increasing clearances for arthritic residents.

While ADAAG, UFAS, and ANSI accessibility standards were all developed with the intention of providing greater access for individuals with disabilities, their standards are based upon assumed stature and strength, whereby dimensional and grab bar requirements are intended to facilitate wheelchair-to-toilet transfers by individuals with sufficient upper body strength and mobility to effect such a transfer. The typical nursing home resident is unlikely to have such capabilities, thus requiring the assistance of one or more staff. Insufficient clearance at the side of the toilet can restrict staff mobility and access, and can result in injury. There are ongoing efforts aimed at educating regulators and advisory panels to the difficulties ~~encountered~~ caused by inappropriate standards required within environments serving frail and geriatric populations.

Alternative grab bar configurations should address the following scenarios:

a. When a resident is capable of independent transfer facilitated by the grab bar and side-wall location required by accessibility standards, a removable/temporary wall structure and grab bar can be installed alongside the toilet.

b. When a resident requires partial assistance in transfer, fold-down grab bars on one or both sides of the toilet would facilitate such transfers.

A8.14.A8. Consideration should be given to increasing clearances for arthritic residents and for mounting handrails lower than required by ADA, to enable frail residents to lean on the handrails for support when ambulating.

A8.30.B2. Handrail projections of up to 3.5 inches (88.9 millimeters) should not be construed as diminishing the clear inside dimensions.

A8.31.D1. ASHRAE Standard 55 recommends 30 to 60 percent relative humidity for comfort. In cold or arid climates, achieving relative humidities as high as 30 percent may not be practical. Where central ventilation systems are not utilized, these humidity requirements may not be achievable. Additional data are needed to establish a consensus on the cost/benefit of maintaining humidity within the recommended range.

If duct humidifiers are located upstream of the final filters, they should be ~~located~~ at least 15 feet (4.56 meters) upstream of the final filters. Ductwork with duct-mounted humidifiers located downstream of the final filters should have a means of water removal. An adjustable high-limit humidistat should be located downstream of the humidifier to reduce the potential ~~of~~ for condensation inside the duct. All duct takeoffs should be sufficiently downstream of the humidifier to ensure complete moisture absorption. Steam humidifiers should be used. Reservoir-type water spray or evaporative pan humidifiers should not be used.

~~Exhaust hoods handling grease-laden vapors in food preparation centers should comply with NFPA 96. All hoods over cooking ranges should be equipped with grease filters, fire extinguishing systems, and heat-actuated fan controls. Cleanout openings should be provided every 20 feet (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. (Horizontal runs of ducts serving range hoods should be kept to a minimum.)~~

A8.31.D8. It is recommended that when practical, ventilation requirements be met by a central air-handling system with filtration and humidification provisions. This system may be designed for ventilation only, with heating and cooling accomplished by non-central air-handling equipment (e.g., fan coil units, heat pumps~~, etc.~~). These non-central units should be equipped with permanent, cleanable or replaceable filters with a minimum efficiency of 68 percent weight arrestance. For ventilation purposes, these units may be used as recirculating units only.

A8.31.E3c. There are several ways to treat domestic water systems to kill *Legionella* and opportunistic waterborne pathogens. Complete removal of these organisms is not feasible, but methods to reduce the amount include hyperchlorination (free chlorine, chlorine dioxide, monochloramine), elevated hot water temperature, ozone injection, silver/copper ions, and ultraviolet light. Each of these options has advantages and disadvantages. While increasing the hot water supply temperature to 140°F (60°C) is typically considered the easiest option, the risk of scalding, especially to youth and the elderly, is significant. See CDC, ASHRAE, and ASPE documentation for additional information.

A8.32.A4a. The reader should refer to ~~the *IES Lighting Handbook* and *Lighting for Health Care Facilities* for additional information~~ANSI/IESNA RP-28-01, *Lighting and the Visual Environment for Senior Living,* for additional information.

A8.32.A4.b. Excessive differences in lighting levels should be avoided in transition areas between parking lots, building entrances and lobbies or corridors, in transition zones between driveways and parking garages, etc. As the eye ages, pupils become smaller and less elastic, making visual adaptation to dark spaces slower. Upon entering a space with a considerably lower lighting level, elderly residents may need to stop or move to one side until their eyes adapt to excessive lighting changes. Elderly pedestrians may need several minutes to adjust to significant changes in brightness when entering a building from a sunlit walkway or terrace.

Consideration should be given to increasing both indoor and outdoor illumination levels in such transition spaces to avoid excessive differences between electric lighting levels and natural daytime and nighttime illumination levels. In addition, it is very helpful for pedestrians to have conveniently located places to wait, giving them time to adjust their eyes to different lighting environments. Seating areas off busy lobbies or corridors can minimize the potential for accidents by giving them the ~~extra~~ time they need.

Care should be taken to minimize extremes of brightness within spaces and in transitions between spaces. Excessive brightness contrast from windows or lighting systems can disorient residents.

Research has established that older adults sleep best in total darkness. Therefore, to minimize resident sleep disruption, night lights should: (1) provide very low levels of illumination; (2) be so located as to minimize light scatter and reflections on room surfaces; and (3) be switched off when not needed. However, even when properly specified, located and operated, night lights often disturb resident sleep.

Therefore, many providers prefer to have staff wear portable light sources instead of using night lights that were installed primarily to satisfy a code requirement.

Lighting that creates glare and colors that do not differentiate between horizontal and vertical planes, or between objects and their backgrounds (such as handrails or light switches from walls, hardware from doors, faucets from sinks, or control knobs from appliances) should be avoided, unless therapeutic benefits can be demonstrated. (For example, it has been demonstrated that deliberately camouflaged door hardware may help control wandering and elopements by some cognitively impaired residents in Alzheimer's care facilities.)

A8.32.A4.c. Care should be taken to avoid injury from lighting fixtures. Light sources that may burn residents or ignite bed linen by direct contact should be covered or protected.

~~Determination of average illuminance~~ Ambient light levels are determined on a horizontal plane ~~from general lighting only~~above the floor. The use of this method in the types of areas described should result in values of average illuminance within 10 percent of the values that would be obtained by dividing the area into 2-foot (0.6-meter) squares, taking a reading in each square, and averaging.

The measuring instrument should be positioned so that when readings are taken, the surface of the light-sensitive cell is in a horizontal plane and 30 inches (760 millimeters) above the floor. This can be facilitated by means of a small portable stand of wood or other material that will support the cell at the correct height and in the proper plane. Daylight may be excluded during illuminance measurements. Readings can be taken at night or with shades, blinds, or other opaque covering on the fenestration.

9. OUTPATIENT FACILITIES

9.1 General

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

9.1.A. Section Applicability

This section applies to the outpatient unit in a hospital, a freestanding facility, or an outpatient facility in a multiple-use building containing an ambulatory health care center as defined under the NFPA 101 Life Safety Code occupancy chapters.

The general standards set forth in Sections 9.1 and 9.2 apply to each of the ~~items~~ facility types below. Additions and/or modifications shall be made as described for the specific facility type.

Specialty facilities such as those for renal dialysis, cancer treatment, mental health, rehabilitation, etc., have needs that are not addressed here. They must satisfy additional conditions to meet respective programs' standards.

Specifically described are:

9.1.A1. Primary Care Outpatient Center (Section 9.3).

9.1.A2. ~~The~~ Small Primary (Neighborhood) Outpatient Facility (Section 9.4).

9.1.A3. ~~The~~ Outpatient Surgical Facility (Section 9.5).

9.1.A4. ~~The~~ Freestanding ~~Emergency~~ Urgent Care Facility (Section 9.6).

9.1.A5. Freestanding Birthing Center (Section 9.7).

9.1.A6. Freestanding Outpatient Diagnostic and Treatment Facility (Section 9.8).

9.1.A7. Gastrointestinal Endoscopy Facility (Section 9.9).

9.1.A8. Psychiatric Outpatient Center (Section 9.11).

9.1.A9. Renal Dialysis (Acute and Chronic) Center (Section 9.12).

9.1.B. Outpatient Facility Classification

Except for the emergency unit, the outpatient facilities described herein are used primarily by patients capable of traveling into, around, and out of the facility unassisted. This group includes the disabled confined to wheelchairs. Occasional facility use by stretcher patients ~~should~~ shall not be used as a basis for more restrictive institutional occupancy classifications.

Facilities shall comply with the "Ambulatory Health Care Centers" section of NFPA 101, in addition to details herein, where patients are rendered incapable of self-preservation due to the care process. The "Business Occupancy" section of NFPA 101 applies to other types of outpatient facilities. Outpatient units that are part of another facility may be subject to the additional requirements of the other occupancy.

References are made to ~~Section~~ Chapter 7, General Hospital, for certain service spaces. Those references are intended only for the specific areas indicated.

9.1.C. Facility Access
Where the outpatient unit is part of another facility, separation and access shall be maintained as described in NFPA 101. Building entrances used to reach the outpatient services shall be at grade level, clearly marked, and located so that patients need not go through other activity areas. (Lobbies of multi-occupancy buildings may be shared.) Design shall preclude unrelated traffic within the unit.

9.1.D. Functional Program Provision
Each project sponsor shall provide a functional program for the facility. (See Section 1.1.F.)

9.1.E. Shared/Purchased Services
When services are shared or purchased, modification or elimination of space and equipment ~~should be modified or eliminated~~ to avoid unnecessary duplication is permitted.

***9.1.F. Location**

9.1.G. Parking
In the absence of a formal parking study, parking for outpatient facilities shall be provided at the rate noted for each type of unit. On-street parking, if available and acceptable to local authorities having jurisdiction, may satisfy part of this requirement unless described otherwise. If the facility is located in a densely populated area where a large percentage of patients arrive as pedestrians,~~;~~ or if adequate public parking is available nearby~~;~~, or if the facility is conveniently accessible via public transportation, adjustments to this standard may be made with approval of the appropriate authorities.

9.1.H. Privacy for Patients
Each facility design shall ensure appropriate levels of patient ~~audible~~ acoustical and visual privacy and dignity throughout the care process, consistent with needs established in the functional program. See Section 1.6.

9.2 Common Elements for Outpatient Facilities

The following shall apply to each outpatient facility described herein, with additions and/or modifications as noted for each specific type. ~~Special c~~Consideration shall be given to the special needs of anticipated patient groups/demographics as determined by the functional program.

***9.2.A. Administrative~~on~~ and Public Areas**. The following shall be provided:

9.2.A1. Entrance. This shall be ~~L~~located at grade level and be able to accommodate wheelchairs.

9.2.A2. Public services. These shall include:

a. Conveniently accessible wheelchair storage.

b. A reception and information counter or desk.

*c. Waiting space(s).

d. Conveniently accessible public toilet(s). Toilet(s) for public use shall be accessible from the waiting area

without passing through patient care or staff work areas or suites.

e. Conveniently accessible public telephone(s).

f. Conveniently accessible drinking fountain(s).

9.2.A3. Interview space(s). Space(s) shall be provided for private interviews related to social service, credit, etc.~~, shall be provided.~~

9.2.A4. General or individual office(s). Office(s) shall be provided for business transactions, records, and administrative~~,~~ and professional staffs~~ shall be provided~~.

~~**9.2.A5.** Clerical space or rooms for typing, clerical work, and filing, separated from public areas for confidentiality, shall be provided.~~

~~**9.2.A6.** Multipurpose room(s) equipped for visual aids shall be provided for conferences, meetings, and health education purposes.~~

9.2.A~~7~~5. Special storage for staff personal effects. Such storage shall have~~with~~ locking drawers or cabinets (may be individual desks or cabinets)~~ shall be provided~~. ~~Such storage~~ It shall be near individual work~~-~~stations and shall be staff controlled.

9.2.A~~8~~6. General storage facilities for supplies and equipment. These facilities shall be provided as needed for continuing operation.

9.2.A~~9~~7. Water supply and drainage facility. In new construction and renovation where hemodialysis or hemoperfusion are routinely performed, ~~there shall be~~ a separate water supply and ~~a~~ drainage facility that does not interfere with handwashing shall be provided.

9.2.B. Clinical Facilities

~~As needed, t~~Clinical and support areas shall be provided to support the functional program. The following spaces are common to most outpatient facilities~~he following elements shall be provided for clinical services to satisfy the functional program~~:

*__9.2.B1.__ General-purpose examination room(s). Rooms ~~F~~for medical, obstetrical, and similar examinations, if provided, ~~rooms~~ shall have a minimum floor area of 80 net square feet (7.43 square meters). This square footage shall~~,~~ exclude~~ing~~ vestibules, toilets, ~~and~~ closets, and fixed casework. Room arrangement ~~should~~ shall permit at least 2 feet 8 inches (812.8 millimeters) clearance at each side and at the foot of the examination table. A handwashing station and a counter or shelf space for writing shall be provided.

*__9.2.B2.__ Special-purpose examination rooms. Rooms for special clinics such as eye, ear, nose, and throat examinations, if provided, shall have a minimum floor area of 80 net square feet (7.43 square meters). This square footage shall exclude vestibules, toilets, closets, and fixed casework. Room arrangement shall permit a minimum clearance of 2 feet, 8 inches (0.81 meter) at each side and at the foot of the examination table, bed, or chair.~~be designed and outfitted to accommodate procedures and equipment used.~~ A handwashing station and a counter or shelf space for writing shall be provided.

*__9.2.B3.__ Treatment room(s). Rooms for minor surgical and cast procedures~~,~~ ~~(~~if provided~~)~~, shall have a

minimum floor area of 120 square feet (11.15 square meters).~~,~~ This square footage shall exclud~~ing~~e vestibule, toilet, ~~and~~ closets, and fixed casework. The minimum room dimension shall be 10 feet (3.05 meters). Room arrangement shall permit a minimum clearance of 3 feet (0.91 meter) at each side and at the foot of the bed. A handwashing station and a counter or shelf for writing shall be provided.

***9.2.B4.** Observation room(s). If provided, ~~O~~observation rooms for the isolation of suspect or disturbed patients shall have a minimum floor area of 80 square feet (7.43 square meters). This square footage shall exclude vestibule, toilet, closets, and fixed casework. ~~and~~and the room shall be convenient to a nurse or control station~~. This is to permit close observation of patients and to minimize possibilities of patients' hiding, escape, injury, or suicide. An examination room may be modified to accommodate this function. A toilet room with lavatory should be immediately accessible.~~

9.2.B5. Nurses station(s). A work counter, communication system, space for supplies, and provisions for charting shall be provided.

9.2.B6. Drug distribution station. This may be a part of the nurses station and shall include a work counter, sink, refrigerator, and locked storage for biologicals and drugs.

9.2.B7. Clean storage. A separate room or closet for storing clean and sterile supplies shall be provided. This storage shall be in addition to that of cabinets and shelves.

9.2.B8. Soiled holding. Provisions shall be made for separate collection, storage, and disposal of soiled materials.

9.2.B9. Sterilizing facilities. A system for sterilizing equipment and supplies shall be provided. Sterilizing procedures may be done on- or off-site, or disposables may be used to satisfy functional needs.

9.2.B10. Wheelchair storage space. Such storage shall be out of the direct line of traffic.

9.2.B11. Airborne infection isolation rooms. In facilities whose functional program includes treatment of patients with known infectious disease, ~~T~~the need for and number of such rooms ~~required airborne infection isolation rooms~~ shall be determined by an infection control risk assessment (ICRA). ~~When~~ Where ~~required, the~~ airborne infection isolation room(s) are required, they shall comply with the general requirements of Section 7.2.C, except that a shower or tub shall not be required.

9.2.B12. Protective environment rooms. The need for and number of required protective environment rooms shall be determined by an infection control risk assessment. When required, the protective environment room(s) shall comply with the general requirements of Section 7.2.D, except that a toilet, bathtub, or shower shall not be required.

9.2.B13. Toilet(s) for patient use. These shall be provided separate from public use toilet(s) and located to permit access from patient care areas without passing through publicly accessible areas.

9.2.C. Radiology

Basic diagnostic procedures (these may be part of the outpatient service, off-site, shared, by contract, or by referral) shall be provided, and shall includ~~ing~~e the following:

9.2.C1. Radiographic room(s). See Section 7.~~10~~ 12 for special requirements.

9.2.C2. Film processing facilities.

9.2.C3. Viewing and administrative areas(s).

9.2.C4. Storage facilities for exposed film.

9.2.C5. Toilet rooms with handwashing stations. These shall be accessible to ~~fluoroscopy~~ procedure room(s), if ~~fluoroscopic~~ procedures provided may result in the need for immediate access to patient toilet facilities~~are part of the program~~.

9.2.C6. Dressing rooms or booths.~~,~~ These shall be provided as required by the functional program~~services provided~~, with convenient toilet access.

***9.2.C7.** Access.

9.2.D. Laboratory
Facilities shall be provided within the outpatient department, or through an effective contract arrangement with a nearby hospital or laboratory service, for hematology, clinical chemistry, urinalysis, cytology, pathology, and bacteriology. If these services are provided on contract, the following laboratory facilities shall also be provided in (or be immediately accessible to) the outpatient facility:

9.2.D1. Laboratory work counter(s), with sink, vacuum, gas, and electric services.

9.2.D2. Lavatory(ies) or counter sink(s) equipped for handwashing.

9.2.D3. Storage cabinet(s) or closet(s).

9.2.D4. Specimen collection facilities with a water closet and lavatory. Blood collection facilities shall have seating space, a work counter, and handwashing station.

9.2.E. Housekeeping Room(s)
At least one housekeeping room per floor shall be provided. It shall contain a service sink and storage for housekeeping supplies and equipment.

~~**9.2.F. Staff Facilities**~~
~~Staff locker rooms and toilets shall be provided.~~

9.2.~~G~~F. Engineering Service and Equipment Areas
The following shall be provided (~~these~~ may be shared with other services provided capacity is appropriate for overall use):

9.2.~~G~~F1. Equipment room(s) for boilers, mechanical equipment, and electrical equipment.

9.2.~~G~~F2. Storage room(s) for supplies and equipment.

9.2.~~G~~F3. Waste processing services:

a. Space and facilities shall be provided for the sanitary storage and disposal of waste.

b. If incinerators and/or trash chutes are used, they shall comply with NFPA 82.

c. Incinerators, if used, shall also conform to the standards prescribed by area air pollution regulations.

9.2.~~H~~G. Details and Finishes

9.2.~~H~~G1. Details shall comply with the following standards:

a. Minimum public corridor width shall be 5 feet (1.52 meters). Staff-only corridors may be 44 inches (1.12 meters) wide.

b. Each building shall have at least two exits that are remote from each other. Other details relating to exits and fire safety shall comply with NFPA 101 and the standards outlined herein.

c. Items such as drinking fountains, telephone booths, vending machines, etc., shall not restrict corridor traffic or reduce the corridor width below the required minimum. Out-of-traffic storage space for portable equipment shall be provided.

d. The minimum nominal door width for patient use shall be 3 feet (0.91 meter). If the outpatient facility ~~services~~ serves hospital inpatients, the minimum nominal width of doors to rooms used by hospital inpatients transported in beds shall be 3 feet 8 inches (1.12 meters).

e. Doors, sidelights, borrowed lights, and windows glazed to within 18 inches (457.2 millimeters) of the floor shall be constructed of safety glass, wired glass, or plastic glazing material that resists breakage and creates no dangerous cutting edges when broken. Similar materials shall be used in wall openings of playrooms and exercise rooms unless otherwise required for fire safety. Glazing materials used for shower doors and bath enclosures shall be safety glass or plastic.

f. Threshold and expansion joint covers shall be flush with the floor surface to facilitate use of wheelchairs and carts.

g. Handwashing stations shall be located and arranged to permit proper use and operation. Particular care shall be taken to provide the required clearance for blade-type handle operation.

h. Provisions for hand drying shall be included at all handwashing stations except scrub sinks.

i. Radiation protection for ~~X~~x-ray and gamma ray installations shall comply with Section 7.10~~.~~12

j. The minimum ceiling height shall be 7 feet 10 inches (2.39 meters), with the following exceptions:

(1) Boiler rooms shall have ceiling clearances not less than 2 feet 6 inches (~~762 millimeters~~0.81 meter) above the main boiler header and connecting piping.

(2) Radiographic and other rooms containing ceiling-mounted equipment shall have ceilings of sufficient height to accommodate the equipment and/or fixtures.

(3) Ceiling~~s~~ height in corridors, storage rooms, toilet rooms, and other minor rooms shall not be less than 7 feet 8 inches (2.34 meters).

(4) Tracks, rails, and pipes suspended along the path of normal traffic shall be not less than 6 feet 8 inches (2.03 meters) above the floor.

k. Rooms containing heat-producing equipment (such as boiler or heater rooms) shall be insulated and ventilated to prevent occupied adjacent floor or wall surfaces from exceeding a temperature 10°F degrees above the ambient room temperature.

9.2.HG2. Finishes shall comply with the following standards:

a. Cubicle curtains and draperies shall be noncombustible or flame-retardant and shall pass both the large- and small-scale tests required by NFPA 701.

b. Interior finish materials shall have flame-spread and smoke-production limitations as described in NFPA 101. Wall finishes less than 4 mil thick applied over a noncombustible material are not subject to flame-spread rating requirements.

c. Building insulation materials, unless sealed on all sides and edges, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 150 or less when tested in accordance with NFPA 255.

db. The flame-spread and smoke-developed ratings of finishes shall comply with Section 7.29 32 and Table 9.1. Where possible, the use of materials known to produce large amounts of noxious gases shall be avoided.

ec. Floor materials shall be readily cleanable and appropriately wear-resistant. In all areas subject to wet cleaning, floor materials shall not be physically affected by liquid germicidal and cleaning solutions. Floors subject to traffic while wet, including showers and bath areas, shall have a nonslip surface.

fd. Wall finishes shall be washable and, in the proximity of plumbing fixtures, shall be smooth and moisture resistant.

ge. Wall bases in areas that are frequently subject to wet cleaning shall be monolithic and coved with the floor; tightly sealed to the wall; and constructed without voids.

hf. Floor and wall areas penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of rodents and insects. Joints of structural elements shall be similarly sealed.

9.2.IH. Relevant Codes and Standards Design and Construction, Including Fire-Resistive Standards

9.2.I1. Construction and structural elements of freestanding outpatient facilities shall comply with recognized model- building- code requirements for offices and to the standards contained herein. Outpatient facilities that are an integral part of the a hospital or that share common areas and functions with a hospital shall comply with the construction standards for general hospitals. See applicable sections of Chapter 7of this document for additional details.

9.2.I2. Interior finish materials shall have flame- spread and smoke- production limitations as described in NFPA 101. Wall finishes less than 4 mil thick applied over a noncombustible material are not subject to flame- spread rating requirements.

9.2.I3. Building insulation materials, unless sealed on all sides and edges, shall have a flame- spread rating of 25 or less and a smoke- developed rating of 150 or less when tested in accordance with NFPA 255.

9.2.JI. Provision for Disasters

Seismic- force resistance of new construction for outpatient facilities shall comply with Section 1.5 and

shall be given an importance factor of one. Where the outpatient facility is part of an existing building, that facility shall comply with applicable local codes. Special design provisions shall be made for buildings in regions that have sustained loss of life or damage to buildings from hurricanes, tornadoes, floods, or other natural disasters.

9.3 Primary Care Outpatient Center~~s~~

9.3.A. General

The primary care center provides comprehensive community outpatient medical services. The number and type of diagnostic, clinical, and administrative areas shall be sufficient to support the services and estimated patient load described in the program. All standards set forth in Sections 9.1 and 9.2 shall be met for primary care outpatient centers, with additions and modifications described herein. (See Section 9.4 for smaller care centers.)

9.3.B. Parking

Parking spaces for patients and family shall be provided at the rate of not less than two parking spaces for each examination and each treatment room. In addition, one space for each of the maximum number of staff persons on duty at any one shift ~~will~~ shall be provided. Adjustments, as described in Section 9.1.G, ~~should be made~~are permitted where public parking, public transportation, etc., reduces the need for on-site parking.

9.3.C. Administrative Services

Each outpatient facility shall make provisions to support administrative activities, filing, and clerical work as appropriate. (See also Section 9.2.A.) Service areas shall include:

9.3.C1. Office(s), separate and enclosed, with provisions for privacy.

9.3.C2. Clerical space or rooms for typing and clerical work separated from public areas to ensure confidentiality.

9.3.C3. Filing cabinets and storage for the safe and secure storage of patient records with provisions for ready retrieval.

9.3.C4. Office supply storage (closets or cabinets) within or convenient to administrative services.

9.3.C5. A staff toilet and lounge in addition to and separate from public and patient facilities.

9.3.C6. Multiuse rooms for conferences, meetings, and health education. One room may be primarily for staff use but also available for public access as needed. In smaller facilities, the room may also serve for consultation~~, etc~~and other purposes.

9.3.D. Public Areas

Public areas shall be situated for convenient access and designed to promote prompt accommodation of patient needs, with consideration for personal dignity.

9.3.D1. Entrances shall be well marked and at grade level. Where entrance lobby and/or elevators are shared with other tenants, travel to the outpatient unit shall be direct and accessible to the disabled. Except for passage through common doors, lobbies, or elevator stations, patients shall not be required to go through other occupied areas or outpatient service areas. Entrances shall be convenient to parking and ~~available~~ accessible via public transportation.

9.3.D2. A reception and information counter or desk shall be located to provide visual control of the entrance to the outpatient unit, and shall be immediately apparent from that entrance.

9.3.D3. The waiting area for patients and escorts shall be under staff control. The seating area shall contain not less than two spaces for each examination and/or treatment room. Where the outpatient unit has a formal pediatrics service, a separate, controlled area for pediatric patients shall be provided. Wheelchairs ~~within the waiting area will~~ shall be accommodated within the waiting area.

~~**9.3.D4.** Toilet(s) for public use shall be immediately accessible from the waiting area. In smaller units the toilet may be unisex and also serve for specimen collection.~~

9.3.D~~5~~4. Drinking fountains shall be available for waiting patients. In shared facilities, drinking fountains may be outside the outpatient area if convenient for use.

9.3.D~~6~~5. A control counter (may be part of the reception, information, and waiting room control) shall have access to patient files and records for scheduling of services.

9.3.E. Diagnostic

Provisions shall be made for ~~X~~x-ray and laboratory procedures as described in Sections 9.2.C and D. Services may be shared or provided by contract off-site. Each outpatient unit shall have appropriate facilities for storage and refrigeration of blood, urine, and other specimens. All standards set forth in Section 9.31 shall be met.

***9.3.F. Clinical Facilities**

9.4 Small Primary (Neighborhood) Outpatient Facility

9.4.A. General

Facilities covered under this section are often contained within existing commercial or residential buildings as "store-front" units, but they may also be ~~a~~ small, freestanding, new, or converted structures. The term *small structure* shall be defined as space and equipment serving four or fewer workers at any one time. The size of these units limits occupancy, thereby minimizing hazards and allowing for less stringent standards. Needed community services can therefore be provided at an affordable cost. ~~The term *small structure* shall be defined as space and equipment serving four or fewer workers at any one time.~~ Meeting all provisions of Section 9.2 for general outpatient facilities is desirable, but limited size and resources may preclude satisfying any but the basic minimums described. This section does not apply to outpatient facilities that are within a hospital, nor is it intended for the larger, more sophisticated units.

9.4.B. Location

The small neighborhood center is expected to be especially responsive to communities with limited income. It is essential that it be located for maximum accessibility and convenience. In densely populated areas, many of the patients might walk to services. Where a substantial number of patients rely on public transportation, facility location shall permit convenient access requiring a minimum of transfers.

9.4.C. Parking

Not less than one convenient parking space for each staff member on duty at any one time and not less than four spaces for patients shall be provided. Parking requirements may be satisfied ~~with~~ by street parking, or by a nearby public parking lot or garage. Where the facility is within a shopping center or similar area, customer spaces may meet parking needs.

9.4.D. Administration and Public Areas

9.4.D1. Public areas shall include:

a. A reception and information center or desk.

b. Waiting space, including provisions for wheelchairs.

~~c. Patient toilet facilities.~~

9.4.D2. An office area for business transactions, records, and other administrative functions, separate from public and patient areas, shall be provided.

9.4.D3. General storage facilities for office supplies, equipment, sterile supplies, and pharmaceutical supplies shall be provided.

9.4.D4. Locked storage (cabinets or secure drawers) convenient to work~~-~~stations shall be provided for staff valuables.

9.4.E. Clinical Facilities

9.4.E1. At least one examination room shall be available for each provider who may be on duty at any one time. Rooms may serve both as examination and treatment spaces (see Section 9.2.B1).

9.4.E2. A clean work area with a counter, handwashing station, and storage for clean supplies~~,~~ shall be provided. This may be a separate room or an isolated area.

9.4.E3. A soiled holding room shall be provided (see Section 9.2.B8).

9.4.E4. Sterile equipment and supplies shall be provided to meet functional requirements. Sterile supplies may be prepackaged disposables or processed off-site.

9.4.E5. Locked storage for biologicals and drugs shall be provided.

9.4.E6. A toilet room containing a ~~lavatory for~~ handwashing station shall be accessible from all examination and treatment rooms. Where a facility contains no more than three examination and/or treatment rooms, the patient toilet ~~may~~ shall be permitted to~~also~~ serve waiting areas.

9.4.F. Diagnostic Facilities

9.4.F1. The functional program shall describe where and how diagnostic services will be made available to the outpatient if ~~these~~ they are not offered within the facility. When provided within the facility, these services shall meet the standards of Section 9.2.

9.4.F2. Laboratory services and/or facilities shall meet the following standards:

a. Urine collection rooms shall be equipped with a water closet and ~~lavatory~~handwashing station. ~~Blood collection facilities shall have space for a chair and work counter. (~~The toilet room provided within the examination and treatment room ~~may~~ is permitted to be used for specimen collection.~~)~~

b. Blood collection facilities shall have space for a chair and work counter.

bc. Services shall be available within the facility or through a formal agreement or contract with a hospital or other laboratory for hematology, clinical chemistry, urinalysis, cytology, pathology, and bacteriology.

9.4.G. Details and Finishes
Construction and finishes may be of any type permitted for business occupancies as described in NFPA 101 and as specified herein.See Section 9.2.H.

9.4.H. Design and Construction
9.4.H1. Every building and every portion thereof shall be designed and constructed to sustain all dead and live loads in accordance with accepted engineering practices and standards. If existing buildings are converted for use, consideration shall be given to the structural requirements for concentrated floor loadings, including Xx-ray equipment, storage files, and similar heavy equipment that may be added.

9.4.H2. Construction and finishes may be of any type permitted for business occupancies as described in NFPA 101 and as specified herein.

9.4.I. Mechanical Standards
The following shall apply for the small outpatient facility of this section in lieu of Section 9.31:

9.4.I1. Heating and ventilation systems shall meet the following standards:

a. A minimum indoor winter-design-capacity temperature of 75°F (24°C) shall be set for all patient areas. Controls shall be provided for adjusting temperature as appropriate for patient activities and comfort.

b. All occupied areas shall be ventilated by natural or mechanical means.

c. Air-handling duct systems shall meet the requirements of NFPA 90A.

9.4.I2. Plumbing and other piping systems shall meet the following standards:

a. Systems shall comply with applicable codes, be free of leaks, and be designed to supply water at sufficient pressure to operate all fixtures and equipment during maximum demand.

b. Backflow preventers (vacuum breakers) shall be installed on all water supply outlets to which hoses or tubing can be attached.

c. Water temperature at lavatories shall not exceed 110°F (43°C).

d. All piping registering temperatures above 110°F (43°C) shall be covered with thermal insulation.

9.4.J. Electrical Standards
The following shall apply to the small outpatient facility of this section in lieu of Section 9.32:

9.4.J1. Prior to completion and acceptance of the facility, all electrical systems shall be tested and operated to demonstrate that installation and performance conform to applicable codes and functional needs.

9.4.J2. Lighting shall be provided in all facility spaces occupied by people, machinery, and/or equipment, and in outside entryways. An examination light shall be provided for each examination and treatment room.

9.4.J3. Sufficient duplex grounded-type receptacles shall be available for necessary task performance. Each examination and work table area shall be served by at least one duplex receptacle.

9.4.J4. X-ray equipment installations, when provided, shall conform to NFPA 70.

9.4.J5. Automatic emergency lighting shall be provided in every facility that has a total floor area of more than 1,000 square feet (92.9 square meters), and in every facility requiring stairway exit.

***9.5 Outpatient Surgical Facility**

***9.5.A. General**

Note: When invasive procedures are performed on persons who are known or suspected of having airborne infectious disease, these procedures should not be performed in the operating suite. These procedures shall be performed in a room meeting airborne infection isolation ventilation requirements or in a space using local exhaust ventilation. If the procedure must be performed in the operating suite, see the CDC "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health Care Facilities."

9.5.A1. The outpatient surgical facility shall be designed to facilitate movement of patients and personnel into, through, and out of defined areas within the surgical suite. Signs shall be provided at all entrances to restricted areas and shall clearly indicate the surgical attire required.

9.5.A2. The outpatient surgical facility shall be divided into three designated areas—unrestricted, semirestricted, and restricted—that are defined by the physical activities performed in each area.

9.5.A3. Outpatient surgery is performed without anticipation of overnight patient care. The functional program shall describe in detail staffing, patient types, hours of operation, function and space relationships, transfer provisions, and availability of off-site services.

9.5.A43. If the outpatient surgical facility is part of an acute-care hospital or other medical facility, service may be shared to minimize duplication as appropriate. Where outpatient surgical services are provided within the same area or suite as inpatient surgery, additional space shall be provided as needed. If inpatient and outpatient procedures are performed in the same room(s), the functional program shall describe in detail scheduling and techniques used to separate inpatients and outpatients.

9.5.A54. Visual and audible acoustical privacy should shall be provided by design and include the registration, preparation, examination, treatment, and recovery areas. See Section 1.6.

9.5.B. Size

The extent (number and types) of the diagnostic, clinical, and administrative facilities to be provided will be determined by the services contemplated and the estimated patient load as described in the functional program. Provisions shall be made for patient examination, medical and nursing assessment, nursig care, preoperative testing, and physical examination interview, preparation testing, and obtaining vital signs of patient for outpatient surgeries.

9.5.C. Parking
Four spaces for each room routinely used for surgical procedures plus one space for each staff member shall be provided. Additional parking spaces convenient to the entrance for pickup of patients after recovery shall be provided.

9.5.D. Administration and Public Areas
The following shall be provided:

***9.5.D1.** A covered entrance for pickup of patients after surgery.

~~**9.5.D2.** A lobby area including a waiting area, conveniently accessible wheelchair storage, a reception/information desk, accessible public toilet(s), public telephone(s), and drinking fountain(s).~~

9.5.D~~3~~2. Interview space(s) for private interviews relating to admission.

9.5.D~~4~~3. General and individual office(s) for business transactions, records, and administrative and professional staff. These shall be separate from public and patient areas with provisions for confidentiality of records. Enclosed office spaces shall be provided~~, consistent with need identified~~ in accordance with the functional program.

9.5.D~~5~~4. Multipurpose or consultation room(s).

9.5.D~~6~~5. A medical records area where medical documents can be secured.

9.5.D~~7~~6. Special storage, including locking drawers and/or cabinets, for staff personal effects.

9.5.D~~8~~7. General storage facilities.

9.5.E. Sterilizing Facilities
A system for sterilizing equipment and supplies shall be provided. When sterilization is provided off site, a room for the adequate handling (receiving and distribution) and on-site storage of sterile supplies ~~must~~ shall be provided that conforms to Section 9.5~~6~~.E3. ~~accommodated and shall meet the minimum requirements for on-site facilities.~~ Provisions shall be made for the ~~cleaning and~~ sanitizing of clean and soiled carts and/or vehicles, consistent with the needs of the particular transportation system. ~~transporting the supplies.~~ If on-site processing facilities are provided, they shall include the following:

9.5.E1. Soiled workroom. ~~This room shall be physically separated from all other areas of the department. Workspace shall be provided to handle the gross cleaning, cleaning, and disinfection of all medical/surgical instruments and equipment. The soiled workroom shall contain work surface(s), sink(s), flush type device(s), and washer/sterilizer decontaminators or other decontamination equipment as appropriate to the functional program.~~ This room (or soiled holding room that is part of a system for the collection and disposal of soiled material) is for the exclusive use of the surgical suite. It shall be located in the restricted area. The soiled workroom shall contain a flushing-rim clinical sink or equivalent flushing-rim fixture, a handwashing station, a work counter, and space for waste receptacles and soiled linen receptacles. Rooms used only for temporary holding of soiled material may omit the flushing-rim clinical sink and work counters. However, if the flushing-rim clinical sink is omitted, other provisions for disposal of liquid waste shall be provided. The room shall not have direct connection with operating rooms. Soiled and clean workrooms or holding rooms shall be separated. A pass-through door for decontaminated instruments is permitted between soiled and clean workrooms.

***9.5.E2.** Clean assembly/workroom. This room shall contain sterilization equipment. ~~This workroom~~ It shall contain a handwashing station, workspace, and equipment for terminal sterilizing of medical and surgical equipment and supplies. Clean and soiled work areas shall be physically separated. Access to ~~the sterilization~~this room shall be restricted. The clean assembly room shall have adequate space for the designated number of work areas as defined in the functional program as well as space for storage of clean supplies, sterilizer carriages (if used), and instrumentation.

9.5.E3. Clean/sterile supplies. Storage for packs, etc., shall include provisions for ventilation, humidity, and temperature control. The clean and sterile supply room shall have a minimum floor area of 100 net square feet (30.48 square meters) or 50 net square feet (15.24 square meters) per operating room, whichever is greater.

***9.5.F. Clinical Facilities**

9.5.F1. If patients will be admitted without recent and thorough examination, at least one room, ensuring both visual and acoustical privacy, shall be provided for examination and testing of patients prior to surgery~~, assuring both visual and audible privacy~~. This may be an examination room or treatment room as described in Sections 9.2.B1 and 3.

9.5.F2. Ambulatory (outpatient) operating rooms.

*a. The size and location of the operating rooms shall be dependent on the level of care and equipment ~~based on~~specified in the functional program. ~~The levels of care are~~Operating rooms shall be as defined by the American College of Surgeons.

b. Class A operating rooms (minor surgical procedure rooms) shall have a minimum ~~clear~~ floor area of ~~120~~ 150 square feet (~~11.15~~45.72 square meters) ~~and~~with a minimum clear dimension of ~~10~~ 12 feet (~~3.05~~3.65 meters). There shall be a minimum clear distance of 3 feet, 6 inches (~~0.91~~1.07 meters) at each side, the head, and the foot of the operating table.

(1) ~~These m~~Minor surgical procedure rooms. These Class A operating rooms may be located within the restricted corridors of the surgical suite, or may be located in an unrestricted corridor adjacent to the surgical suite.

c. Class B operating rooms shall have a minimum ~~clear~~ floor area of 250 square feet (23.23 square meters) with a minimum clear dimension of 15 feet (4.57 meters). This square footage and minimum dimension shall exclude vestibule and fixed casework. Room arrangement ~~There~~ shall ~~be~~permit a minimum clearance of 3 feet, 6 inches (1.07 meters) at each side, the head, and the foot of the operating table.

(1) These intermediate surgical procedure rooms shall be located within the restricted corridors of the surgical suite.

d. Class C operating rooms shall have a minimum clear area of 400 square feet (37.16 square meters) and a minimum dimension of 18 feet (4.59 meters). This square footage and minimum dimension shall exclude vestibule and fixed casework. Room arrangement ~~There~~ shall ~~be~~permit a minimum clearance of 4 feet (1.22 meters) at each side, the head, and the foot of the operating table.

(1) These major surgical procedure rooms shall be located within the restricted corridors of the surgical suite.

*e. All operating rooms shall be equipped with an emergency communication system connected with the control station. There shall be at least one X-ray film illuminatormedical image viewer in each room. See Tables 7.2 and 9.1 for mechanical and medical gas requirements.

9.5.F3. Room(s) for post-anesthesia recovery of outpatient surgical facilities shall be provided in accordance with the functional program. A nurse utility/control station shall be provided with visualization of patients in acute recovery positions (not required in step-down recover area). Clearances noted around gurneys are between the normal use position of the gurney and any adjacent fixed surface, or between adjacent gurneys. In the absence of a formal needs analysis, the patient recovery position minimum requirements are as follows:

*a. For minor surgical procedure rooms (Class A), a minimum of one recovery station per procedure room with a minimum clear area of 2 feet, 6 inches (0.76 meter) around the three sides of the stretcher or lounge chair for work and circulation. Each post-anesthetic care unit (PACU) shall provide a minimum clear floor area of 80 square feet (7.43 square meters) for each patient bed with a space for additional equipment described in the functional program, and for clearance of at least 5 feet (1.52 meters) between patient stretchers and 4 feet (1.22 meters) between patient stretchers and adjacent walls (at the stretcher's sides and foot). Provisions for patient privacy such as cubicle curtains shall be made.

Handwashing stations with hands-free operable controls shall be available with at least one for every four stretchers or portion thereof, uniformly distributed to provide equal access from each patient position.

b. A patient toilet room shall be provided in the recovery area. In facilities with two or fewer operating rooms and an outpatient surgery change area that is located adjacent to the recovery area, the toilet required by Section 9.5.F5j shall be permitted to be used to meet this requirement.

b. For intermediate surgical procedure rooms (Class B), a minimum of two recovery stations per procedure room with a minimum clear area of 3 feet (0.91 meter) around the three sides of the stretcher for work and circulation.

c. For major surgical procedure rooms (Class C), a minimum of three recovery stations per procedure room with a minimum clear area of 4 feet (1.22 meters) around three sides of the stretcher for work and circulation.

cd. If pediatric surgery is part of the program, separation from the adult section and space for parents shall be provided. Sound attenuation of the area and the ability to view the patient from the nursing station shall be considered.

e. Up to one-half of the minimum required total recovery stations may be provided in the step-down recovery area described in 9.5.F4.
df. The recovery areas shall include provisions for staff handwashing station, medication preparation and dispensing, supply storage, soiled linen and waste holding, charting and dictation, and dedicated space as needed to keep equipment (warming cabinet, ice machine, crash cart, etc.) out of required circulation clearances.

9.5.F4. A designated supervised step-down recovery area shall be provided for patients who do not require post-anesthesia recovery but need additional time for their vital signs to stabilize before safely leaving the facility. These stations may account for up to one-half of those required under 9.5.F3. This area shall contain a clinical work space, space for family members, and provisions for privacy. It shall have convenient patient access to toilets large enough to accommodate a patient and an assistant.

~~Handwashing and nourishment facilities must be included.~~ A Phase II or step-down recovery room shall be provided. The room shall contain handwashing station(s), storage space for supplies and equipment, clinical work space, space for family members, and nourishment facilities. In addition, the design shall provide a minimum of 50 square feet (4.65 square meters) for each patient in a lounge chair with space for additional equipment described in the functional program and for clearance of 4 feet (1.22 meters) between the sides of the lounge chairs and the foot of the lounge chairs. Provisions for patient privacy such as cubicle curtains shall be made.

A patient toilet shall be provided with direct access to the Phase II recovery unit for the exclusive use of patients.

9.5.F5. The following services shall be provided in surgical service areas:

a. A control station located to permit visual surveillance of all traffic entering the restricted corridor (access to operating rooms and other ancillary clean/sterile areas).

b. A drug distribution station. Provisions shall be made for storage and preparation of medications administered to patients. A refrigerator for pharmaceuticals and double-locked storage for controlled substances shall be provided. Convenient access to handwashing stations shall be provided.

c. Scrub facilities. Station(s) shall be provided near the entrance to each operating room and may service two operating rooms if needed. Scrub facilities shall be arranged to minimize ~~incidental~~ splatter on nearby personnel or supply carts.

d. A ~~S~~soiled workroom. The soiled workroom shall contain a clinical sink or equivalent flushing-type fixture, a work counter, a handwashing station, and waste receptacle(s). This may be the same workroom described in Section 9.5.E1. The soiled workroom shall be located within the semirestricted area.

e. Fluid waste disposal facilities. These shall be convenient to the general operating rooms and post-anesthesia recovery positions. A clinical sink or equivalent equipment in a soiled workroom shall meet this requirement in the operating room area, and a toilet equipped with bedpan-~~-~~cleaning device or a separate clinical sink shall meet the requirement in the recovery area.

f. Provisions ~~shall be made~~ for cleaning, testing, and storing anesthesia equipment and supplies as needed for the functional program. For Class C facilities, a dedicated anesthesia workroom shall be provided and shall contain a work counter, handwashing station, and storage for related anesthesia supplies. It shall be located within the semi-restricted area.

g. Medical gas supply and storage with space for reserve nitrous oxide and oxygen cylinders, if such gas(es) are used in the facility.

h. Equipment storage room(s) for equipment and supplies used in the surgical suite. The equipment and supply storage room shall have a minimum floor area of 100 net square feet (30.48 square meters) or 25 net square feet (7.62 square meters) per operating room, whichever is greater.

i. Staff clothing change areas. Appropriate change areas shall be provided for male and female staff working within the surgical suite. The areas shall contain lockers, showers, toilets, handwashing stations, and space for donning scrub attire. These areas shall be arranged to encourage a one-way traffic pattern so that personnel entering from outside the surgical suite can change and move directly into the surgical suite.

j. Outpatient surgery change areas. A separate area shall be provided for outpatients to change from street clothing into hospital gowns and to prepare for surgery. This area shall include lockers, toilet(s), clothing change or gowning area(s), and space for administering medications. Provisions shall be made for securing patients' personal effects.

k. A ~~S~~stretcher storage area. This area shall be convenient for use and out of the direct line of traffic.

l. Lounge and toilet facilities for surgical staff. These shall be provided in facilities having three or more operating rooms. The toilet room shall be ~~provided~~ near the recovery area.

m. A ~~H~~housekeeping room. Space containing a floor receptor or service sink and storage space for housekeeping supplies and equipment shall be provided exclusively for the surgical suite.

n. Space for temporary storage of wheelchairs.

o. Provisions for convenient access to and use of emergency resuscitation equipment and supplies (crash cart(s) and/or anesthesia carts) at both the surgical and recovery areas.

p. A high-speed sterilizer or other sterilizing equipment for immediate or emergency use, located in the restricted area.

q. A clean assembly/workroom as described in Sections 9.5.E and 9.5.E3.

r. At least one shower provided conveniently accessible to the surgical suite and recovery areas.
~~r. A patient toilet room shall be provided in the recovery area. In facilities with two or fewer operating rooms and an outpatient surgery change area that is located adjacent to the recovery area, the toilet required by Section 9.5.F5j shall be permitted to be used to meet this requirement.~~

9.5.G. Diagnostic Facilities
Diagnostic services shall be provided on- or off-site for pre-admission tests as required by the functional program.

9.5.H. Details and Finishes
In addition to ~~All details and finishes shall meet~~ the standards in Section 9.2.~~H~~G, the following guidelines shall be met ~~and below~~.

9.5.H1. Details shall conform to the following guidelines:

a. Minimum public corridor width shall be 5 feet (1.52meters), except that corridors in the operating room section, where patients are transported on stretchers or beds, shall be 8 feet (2.44 meters) wide. Passages and corridors used exclusively for staff access ~~may~~shall be a minimum of 44 inches (1.12 meters) in clear width.

b. The separate facility or section shall comply with the "New Ambulatory Health Care Centers" section of NFPA 101 and ~~as~~with the standards ~~described~~ herein. Where the outpatient surgical unit is part of another facility that does not comply with, or exceeds, the fire safety requirements of NFPA 101, there shall be not less than one-hour separation between the outpatient surgical unit and other sections. The outpatient surgical facility shall have not less than two exits to the exterior. Exits, finishes, separation for hazardous areas, and smoke separation shall conform to NFPA 101.

c. Toilet rooms for patient use in surgery and recovery areas ~~for patient use~~ shall be equipped with doors and hardware that permit access from the outside in emergencies. When such rooms have only one opening or are small, the doors shall open outward or be otherwise designed to open without pressing against a patient who may have collapsed within the room.

d. Flammable anesthetics shall not be used in outpatient surgical facilities.

e. Doors serving occupiable spaces shall have a minimum nominal width of 3 feet (0.91 meter), except doors requiring gurney/stretcher access, which shall have a nominal width of 3 feet, 8 inches (1.12 meters).

9.5.H2. Finishes shall conform to the following guidelines:

a. Ceiling finishes shall be appropriate for the areas in which they are ~~to be~~ located ~~in~~ and shall be as follows:

(1) Ceiling finishes in general areas are optional and may be omitted in mechanical and electrical rooms/spaces unless required for fire-resistive purposes. Suspended ceilings may be omitted in mechanical and electrical rooms/spaces unless required for fire safety purposes.

(2) Ceiling finishes in semirestricted areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms, and minor surgical procedure rooms ~~must~~ shall be smooth, scrubbable, nonabsorptive, nonperforted, capable of withstanding cleaning with chemicals, and without crevices that can harbor mold and bacteria growth. If a lay-in ceiling is ~~provided~~used, it shall be gasketed or clipped down to prevent the passage of particles from the cavity above the ceiling plane into the semirestricted environment. Perforated, tegular, serrated, cut, or highly textured tiles ~~are~~shall not ~~acceptable~~ be used.

(3) Ceilings in restricted areas such as operating rooms shall be monolithic, scrubbable, and capable of withstanding chemicals. Cracks or perforations in these ceilings are not allowed.

b. Wall finishes shall be appropriate for the areas in which they are ~~to be~~ located ~~in~~ and shall be as follows:

(1) Wall finishes shall be cleanable.

(2) Wall finishes in areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms, and minor surgical procedure rooms shall be washable, smooth, and ~~capable~~ able to ~~of~~ withstand~~ing~~ chemical cleaning.

(3) Wall finishes in areas such as operating rooms, delivery rooms, and trauma rooms shall be scrubbable, ~~capable of~~able to withstand~~ing~~ chemical cleaning, and ~~be~~ monolithic.

c. Floor finishes shall be appropriate for the areas in which they are ~~to be~~ located ~~in~~ and shall be as follows:

(1) Floor finishes shall be cleanable.

(2) Floor finishes in areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms, and minor surgical procedure rooms shall be washable, smooth, and ~~capable of~~ able to withstand~~ing~~ chemical cleaning.

(3) Floor finishes in areas such as operating rooms, delivery rooms, and trauma rooms shall be scrubbable, ~~capable of~~able to withstand~~ing~~ chemical cleaning, and ~~be~~ monolithic, with an integral base.

9.5.I. Plumbing
See Section 9.31.

9.5.J. Electrical
See Section 9.32.

9.5.K. Fire Alarm System
A manually operated, electrically supervised fire alarm system shall be installed in each facility as described in NFPA 101.

9.5.L. Mechanical
Heating, ventilation, and air conditioning shall be as described for similar areas in Section 9.31 and Table 7.2, except that the recovery lounge need not be considered a sensitive area, and outpatient operating rooms may meet the standards for emergency trauma rooms. See Table 9.1 for filter efficiency standards.

9.6 Freestanding ~~Emergency~~ Urgent Care Facility

9.6.A. General
~~This section applies to the emergency facility that is separate from the acute-care hospital and that therefore requires special transportation planning to accommodate transfer of patients and essential services. The separate emergency facility provides expeditious emergency care where travel time to appropriate hospital units may be excessive. It may include provisions for temporary observation of patients until release or transfer.~~
~~Where hours of operation are limited, provisions shall be made in directional signs, notices, and designations to minimize potential for mistakes and loss of time by emergency patients seeking care during nonoperating hours.~~

~~Facility size, type, and design shall satisfy the functional program. In addition to standards in Sections 9.1 and 9.2, the following guidelines shall be met:~~

This section applies to facilities that provide emergent care to the public, but that are not part of licensed hospitals or are not freestanding emergency services as described in Section 7.11 or that do not provide care on a 24-hours-per-day, seven-days-per-week basis. Freestanding urgent care facilities should be distinguished from emergency departments that are part of a licensed hospital so the public will understand the level of care offered.

9.6.A.1. The facility shall post signs that clearly indicate the type and level of care offered and the hours of operation (if not 24 hours per day, seven days per week).

9.6.A.2. The facility shall post directional signs and information showing the nearest emergency department that is part of a licensed hospital.

9.6.B. Reserved~~Location~~
~~The emergency facility shall be conveniently accessible to the population served and shall provide patient transfer to appropriate hospitals. In selecting location, consideration shall be given to factors affecting source and quantity of patient load, including highway systems, industrial plants, and recreational areas.~~

~~Though most emergency patients will arrive by private cars, consideration should also be given to availability of public transportation.~~

9.6.C. Parking
Not less than one parking space for each staff member on duty at any one time and not less than two spaces for each examination and each treatment room shall be provided. Additional spaces shall be provided for emergency vehicles. Street, public, and shared lot spaces, if included as part of this standard, shall be exclusively for the use of the emergency facility. All required parking spaces shall be convenient to the emergency entrance.

9.6.D. Administrative and Public Areas
Administrative and public areas shall conform to the standards in Section 9.2.A, with the following additions.

9.6.D1. Entrances shall be well marked, illuminated, and covered to permit protected transfer of patients from ambulance and/or automobiles. If a platform is provided for ambulance use, a ramp for wheelchairs and stretchers shall be provided in addition to steps. Door(s) to ~~emergency services~~patient care rooms serving stretcher-borne patients shall be not less than 4 feet (1.22 meters) wide~~ to allow the passage of a stretcher and assistants~~. All the other doors to patient service areas shall be not less than 3 feet (0.91 meter) wide. The emergency entrance shall have vision panels to minimize conflict between incoming and outgoing traffic and to allow for observation of the unloading area from the control station.

9.6.D2. Lobby and waiting areas shall satisfy the following requirements:

a. Convenient access to wheelchairs and stretchers shall be provided at the emergency entrance.

b. Reception and information function may be combined or separate. These areas shall provide direct visual control of the emergency entrance, and access to the treatment area and the lobby. They shall include a public toilet with handwashing stations, and convenient telephone. Control stations will normally include triage function and shall be in direct communication with medical staff. Emergency entrance control functions shall include observation of arriving vehicles.

c. The emergency waiting area shall include provisions for wheelchairs and shall be separate from the area provided for scheduled outpatient service.

d. If so determined by the hospital ~~infection control risk assessment~~ICRA, the diagnostic imaging waiting area may require special consideration to reduce the risk of airborne infection transmission. In these circumstances, public waiting areas shall be designed, ventilated, and maintained with available technologies such as enhanced general ventilation and air disinfection techniques similar to inpatient requirements for airborne infection isolation rooms. See the ~~"~~CDC "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health Care Facilities."

9.6.D3. Initial interviews may be conducted at the triage reception/control area. Facilities for conducting interviews on means of reimbursement, social services, and personal data shall include provisions for acoustical privacy. These facilities ~~may~~ are permitted to be separate from the reception area but must be convenient to the emergency service waiting area.

9.6.D4. For standards concerning general and individual offices, see Section 9.2.A4.

~~**9.6.D5.** For standards concerning clerical space, see Section 9.2.A5.~~

9.6.D~~6~~5. Multipurpose room(s) shall be provided for staff conferences. This room may also serve for consultation.

9.6.D7~~.~~6 For standards concerning special storage, see Section 9.2.A6~~7~~.

9.6.D~~8~~7. For standards concerning general storage, see Section 9.2.A7~~8~~.

9.6.E. Clinical Facilities
In addition to the requirements of ~~See~~ Section 9.2.B, the following shall be provided:~~ and, in addition, provide:~~

9.6.E1. A trauma/cardiac room~~-~~ for complex procedures as described in Section 9.5.F2 for the outpatient surgery unit. The trauma/cardiac room may be set up to accommodate more than one patient. Where the emergency trauma/cardiac room is set up for multipatient use, each patient area shall have a minimum clear area of 250 net square feet (76.2 square meters) excluding vestibule, toilet, closet, and fixed casework. Room arrangement shall permit a minimum clearance of 3 feet, 6 inches (1.07 meters) at each side, head, and foot of the bed. ~~there shall be not less than 180 square feet (16.72 square meters) per patient area, and there shall be u~~Utilities and services shall be provided for each patient. Provisions shall be included for patient privacy.

9.6.E2. In addition to wheelchair storage, a holding area for stretchers within the clinical area, away from traffic and under staff control.

9.6.E3. A poison control ~~service facilities~~ center with immediately accessible antidotes and a file of common poisons. Communication links with regional and/or national poison centers and regional EMS centers shall be provided. This service may be part of the nurses control and workstation.

9.6.E4. A nurses control and work~~ and control~~ station. This shall accommodate charting, files, and staff consultation activities. It shall be located to permit visual control of clinical area and its access. Communication links with the examination/treatment area, trauma/cardiac room, reception control, laboratory, radiology, and on-call staff shall be provided.

9.6.E5. A CPR emergency cart, away from traffic but immediately available to all areas, including entrance and receiving areas.

9.6.E6. Scrub stations at each trauma/cardiac room. Water and soap controls shall not require use of hands.

9.6.E7. At least two examination rooms and one trauma/cardiac room shall have a clear floor area of 120 net square feet (11.15 square meters) excluding vestibule, toilet, closet, and fixed casework (treatment room may also be utilized for examination). Room arrangement shall permit a minimum clearance of 3 feet, 6 inches (1.07 meters) at each side, head, and foot of the bed.

9.6.F. Radiology
Standards stipulated in Section 9.2.C shall be met during all hours of operation. Radiographic equipment shall be adequate for any part of the body including, but not limited to, fractures. Separate dressing rooms are not required for unit(s) used only for emergency procedures.

9.6.G. Laboratory
See Section 9.2.D for applicable standards. In addition, immediate access to blood for transfusions and provisions for cross-match capabilities shall be provided.

9.6.H. Employee Facilities
~~See Section 9.2.F for applicable standards. In addition, f~~Facilities for on-call medical staff shall be provided.

9.6.I. Observation
Facilities shall be provided for holding emergency patients until they can be discharged or transferred to an appropriate hospital. Size, type, and equipment shall be as required for anticipated patient load and lengths of stay. One or more examination/treatment rooms may be utilized for this purpose. Each observation bed shall permit:

9.6.I1. Direct visual observation of each patient from the nurses station, except where examination/treatment rooms are used for patient holding. View from the duty station may be limited to the door.

9.6.I2. Patient privacy.

9.6.I3. Access to patient toilets.

9.6.I4. Secure storage of patients' valuables and clothing.

9.6.I5. Dispensing of medication.

9.6.I6. Bedpan storage and cleaning.

9.6.I7. Provision of nourishment (see Section 7.2.B15). In addition, meal provisions shall be made for patients held for more than four hours during daylight.

9.6.J. Mechanical
See Section 9.31 for applicable mechanical standards.

9.6.K. Plumbing
See Section 9.31 for applicable plumbing standards.

9.6.L. Electrical
See Section 9.32 for applicable electrical standards.

***9.7 Freestanding Birthing Center**

The freestanding birthing center is "any health facility, place, or institution which is not a hospital and where births are planned to occur away from the mother's usual place of residence" (American Public Health Association, 1982).

All standards set forth in Sections 9.1 and 9.2 shall be met for new construction of birthing centers, with modifications described herein. Birthing rooms shall have available oxygen, vacuum, and medical air per Table 7.5, LDRP rooms.

9.7.A. Parking

Parking spaces for ~~the~~ clients and famil~~y~~ies shall be provided at a rate of not less than two for each birth room. In addition, one space for each of the maximum number of staff persons on duty at any given time ~~will~~ shall be provided. Adjustments, as described in Section 9.1.G, ~~should be made~~are permitted where public parking, public transportation, etc., reduce the need for on-site parking.

9.7.B. Administrative and Public Areas

9.7.B1. Entrance~~:~~. The entrance to the birthing center shall be at ground level, well marked and illuminated. Provisions shall be made for emergency vehicle access.

9.7.B2. Provisions for the disabled~~:~~. See Section 1.4.

9.7.B3. Public areas. These areas shall include:

a. A reception area with facility to accommodate outdoor wear.

b. A family room with a designated play area for children.

c. Child-proof electrical outlets.

d. A nourishment area for families to store and serve light refreshment of their dietary and cultural preferences. The area shall include a sink and counter space, range, oven or microwave, refrigerator, cooking utensils, disposable tableware or dishwasher, storage space, and seating area.

e. Convenient access to toilet and handwashing stations.

f. Convenient access to telephone service.

g. Convenient access to drinking fountain or potable drinking water with disposable cup dispenser.

9.7.B4. Staff area~~:~~. A secure storage space for personal effects, toilet, shower, change, and lounge area sufficient to accommodate staff needs shall be provided.

9.7.B5. Records~~:~~. Space for performing administrative functions, charting, and secure record storage shall be provided.

9.7.B6. Drugs and biologicals~~:~~. An area for locked storage for drugs and refrigeration for biologicals (separate from the nourishment area refrigerator) shall be provided.

9.7.B7. Clean storage~~:~~. A separate area for storing clean and sterile supplies shall be provided.

9.7.B8. Soiled holding~~:~~. Provisions shall be made for separate collection, storage, and disposal of soiled materials. Fluid waste may be disposed of in the toilet adjacent to the birth room.

9.7.B9. Sterilizing facilities~~:~~. Sterile supplies may be prepackaged disposables or processed off-site. If instruments and supplies are sterilized on-site, an area for accommodation of sterilizing equipment appropriate to the volume of the birth center shall be provided.

9.7.B10. Laundry~~:~~. Laundry ~~M~~may be done on- or off-site. If on-site, an area for laundry equipment with

counter and storage space shelving shall be provided. Depending on size and occupancy of center, ordinary household laundry equipment may be provided. (Soiled laundry shall be held in the soiled holding area until deposited in the washer.)

9.7.C. Clinical Facilities

As needed, the following elements shall be provided for clinical services to satisfy the functional program.

9.7.C1. Birthing rooms~~:~~. A minimum of two birthing rooms with storage space sufficient to accommodate belongings of occupants, bedding, equipment, and supplies needed for a family-centered childbirth shall be provided.

a. Birthing rooms shall be adequate in size to accommodate one patient, her family, and attending staff. For new construction, a minimum clear floor area of 160 net square feet (48.76 square meters) shall be provided with a minimum dimension of 11 feet (3.35 meters), excluding vestibule, toilet, closet, and fixed casework. Room arrangement shall permit a minimum clearance of 3 feet (0.91 meter) at each side, head, and foot of the bed. ~~A minimum floor area of 160 square feet (14.86 square meters) for new construction will be provided with a minimum dimension of 11 feet (3.25 meters).~~ For renovation, a minimum floor area of 120 square feet (11.15 square meters) excluding vestibule, toilet, and closets ~~will be provided~~ with a minimum dimension of 10 feet (3.05 meters) shall be provided.

b. An area for equipment and supplies for routine and remedial newborn care, separate from the equipment supplies for maternal care, shall be provided in each birthing room~~ in built-in cabinets, closets, or furniture~~.

c. ~~Medicant~~Medicine, syringes, specimen containers, and instrument packs shall be contained in storage areas not accessible to children.

d. The plan for the birthing room shall be such that it will permit ~~the need for~~ emergency transfer by stretcher unimpeded.

9.7.C2. Toilet and bathing facilities~~:~~. ~~t~~Toilet, ~~sink~~handwashing station, and bath/shower facilities with appropriately placed grab bars shall be adjacent to each birthing room. Bath/shower facilities shall be shared by not more than two birthing rooms.

9.7.C3. Scrub areas~~:~~. Handwashing stations with hands-free faucets shall be ~~located~~ conveniently accessible to the birthing rooms.

9.7.C4. Emergency equipment~~:~~. An area for maternal and newborn emergency equipment and supplies (carts or trays) shall be designated out of the direct line of traffic and conveniently accessible to the birthing rooms.

9.7.C5. Communication~~:~~. Each birthing room shall be equipped with a system for communicating to other parts of the center and to an outside telephone line.

9.8 Freestanding Outpatient Diagnostic and Treatment Facility

*9.8.A. General

This section applies to the outpatient diagnostic and treatment facility that is separate from the acute-care hospital. This facility is a new and emerging form of outpatient center ~~which~~ that is capable of providing a wide array of outpatient diagnostic services and minimally invasive procedures.

The general standards for outpatient facilities set forth in Sections 9.1 and 9.2 shall be met for the freestanding outpatient diagnostic and treatment facility, with two modifications.

9.8.A1. For those facilities performing diagnostic imaging and minimally invasive interventional procedures, all provisions of Section 7.~~10~~12~~, General Hospital Imaging Suite,~~ shall also apply, except that adjacencies to emergency, surgery, cystoscopy, and outpatient clinics are not required.

9.8.A2. For those facilities performing nuclear medicine procedures, all provisions of Section 7.~~11~~14~~, Nuclear Medicine,~~ shall also apply, except that support services such as radiology, pathology, emergency department, and outpatient clinics are not required.

9.9 Gastrointestinal Endoscopy ~~Suite~~Facility

The endoscopy suite may be divided into three major functional areas: the procedure room(s), instrument processing room(s), and patient holding/preparation and recovery room or area. All standards set forth in Sections 9.31 and 9.32 shall be met for new construction of endoscopy suites with modifications described in Section 9.9.

Note: When ~~invasive~~ procedures are to be performed ~~in this unit~~ on persons who are known or suspected of having airborne infectious diseases, these procedures ~~should not be performed in the operating suite. These procedures~~ shall be performed only in a room meeting airborne infection isolation ventilation requirements or in a space using local exhaust ventilation. ~~If the procedure must be performed in the operating suite, s~~See also the CDC "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Facilities."

*9.9.A. General

The endoscopy suite shall be designed to facilitate movement of patients and personnel into, through, and out of defined areas within the procedure suite. Signs shall be provided at all entrances to restricted areas and shall clearly indicate the proper attire required.

The outpatient procedure facility shall be divided into three designated areas—unrestricted, semirestricted, and restricted—that are defined by the physical activities performed in each area.

Endoscopy is performed without anticipation of overnight patient care. The functional program shall describe in detail staffing, patient types, hours of operation, function and space relationships, transfer provisions, and availability of offsite services.

If the endoscopy suite is part of an acute-care hospital or other medical facility, service may be shared to minimize duplication as appropriate. Where endoscopy services are provided within the same area or suite as surgical services, additional space shall be provided as needed. If inpatient and outpatient procedures are performed in the same room(s), the functional program shall describe in detail scheduling and techniques used to separate inpatients and outpatients.

Visual and acoustical privacy should be provided by design and include the registration, preparation, examination, treatment, and recovery areas.

9.9.B. Size

The extent (number and types) of the diagnostic, clinical, and administrative facilities to be provided will be determined by the services contemplated and the estimated patient load as described in the functional

program. Provisions shall be made for patient examination, interview, preparation testing, and obtaining vital signs of patients for endoscopic procedures.

9.9.C. Parking
Four spaces for each room routinely used for endoscopy procedures plus one space for each staff member shall be provided. Additional parking spaces convenient to the entrance for pickup of patients after recovery shall be provided.

9.9.D. Administration and Public Areas
The following shall be provided:

9.9.D1. A covered entrance for pickup of patients after surgery; such roof overhang or canopy shall extend, at a minimum, to the face of the driveway or curb of the passenger access door of the transport vehicle. Vehicles in the loading area shall not block or restrict movement of other vehicles in the drive or parking areas immediately adjacent to the facility.

9.9.D2. A lobby area, including a waiting area, conveniently accessible wheelchair storage, a reception/information desk, accessible public toilet(s), public telephone(s), and drinking fountain(s).

9.9.D3. Interview space(s) for private interviews relating to admission.

9.9.D4. General and individual office(s) for business transactions, records, and administrative and professional staff. These shall be separate from public and patient areas with provisions for confidentiality of records. Enclosed office spaces shall be provided, consistent with need identified in the functional program.

9.9.D5. Multipurpose or consultation room(s).

9.9.D6. A medical records area where medical documents can be secured.

9.9.D7. Special storage, including locking drawers and/or cabinets, for staff personal effects.

9.9.D8. General storage facilities.

9.9.E. Storage and Holding Areas
Adequate space shall be provided for the storage and holding of clean and soiled materials. Such areas shall be separated from unrelated activities and controlled to prohibit public contact.

9.9.E1. Soiled holding/workroom. This room shall be physically separated from all other areas of the department. The soiled workroom shall contain work surface(s), sink(s), flush-type device(s), and holding areas for trash, linen, and other contaminated waste.

9.9.E2. Clean/sterile supplies. Storage for packs, etc., shall include provisions for ventilation, humidity, and temperature control.

***9.9.F. Clinical Facilities**

9.9.F1. If patients will be admitted without recent and thorough examination, at least one room shall be provided for examination and testing of patients prior to their procedures, ensuring both visual and acoustical privacy. This may be an examination room or treatment room as described in Sections 9.2.B1

and 3.

9.9.F2. Procedure Suite

a. Each procedure room shall have a minimum clear floor area of 200 square feet (15 square meters) excluding vestibule, toilet, closet, fixed cabinets, and built-in shelves. Room arrangement shall permit a minimum clearance of 3 feet, 6 inches at each side, head, and foot of the stretcher/table.

b. A separate dedicated handwashing station with hands-free controls shall be available in the suite.

c. Station outlets for oxygen and vacuum (suction) shall be available. See Table 9.2.

d. Floor covering shall be monolithic and joint free.

e. A system for emergency communication shall be provided.

f. Procedure rooms shall be designed for visual and acoustical privacy for the patient. Direct access may be provided to a patient toilet room.

9.9.G. Instrument Processing Room(s)

9.9.G1. Dedicated processing room(s) for cleaning and disinfecting instrumentation shall be provided. In an optimal situation, cleaning room(s) should be located between two procedure rooms. However, one processing room may serve multiple procedure rooms. Size of the cleaning room(s) is dictated by the amount of equipment to be processed.

Cleaning rooms should allow for flow of instrumentation from the contaminated area to the clean area, and finally, to storage. The clean equipment rooms, including storage, should protect the equipment from contamination.

9.9.G2. The decontamination room should be equipped with the following:

a. Utility sink(s), as appropriate to the method of decontamination used. This may require soaking sink(s), rinse sink(s), automated cleaning device(s), or a combination.

b. One freestanding handwashing station.

c. Work counter space(s).

d. Space and plumbing fixtures for automatic endoscope cleaners, sonic processor, and flash sterilizers (where required).

e. Ventilation system. Negative pressure shall be maintained and a minimum of 10 air changes per hour shall be maintained. A hood is recommended over the work counter. All air should be exhausted to the outside to avoid recirculation within the facility.

f. Provision for vacuum and/or compressed air, as appropriate to cleaning methods used.

g. Floor covering, monolithic and joint free.

9.9.H. Patient Holding/Prep/Recovery Area
The following shall be provided in this area:

9.9.H.1. Oxygen and suction per Table 9.2. This shall be provided for each patient cubicle and shall meet the size requirements of a step-down recovery area, Section 9.5.F3.a.

9.9.H.2. Cubicle curtains for patient privacy.

9.9.H.3. Medication preparation and storage with handwashing stations.

9.9.H.4. Toilet facilities (may be accessible from patient holding or directly from procedure room(s) or both).

9.9.H.5. Change areas and storage for patients' personal effects.

9.9.H.6. Nurses reception and charting area with visualization of patients.

9.9.H.7. Clean utility room or area.

9.9.H.8. Janitor/housekeeping closet.

9.9.I. Procedural Service Areas
The following shall be provided:

9.9.I.1. Fluid waste disposal facilities. These shall be convenient to the procedure rooms and recovery positions. A clinical sink or equivalent equipment in a soiled workroom shall meet this requirement in the procedure area, and a toilet equipped with bedpan-cleaning device or a separate clinical sink shall meet this requirement in the recovery area.

9.9.I.2. Provisions for cleaning, testing, and storing anesthesia equipment and supplies.

9.9.I.3. Medical gas supply and storage with space for reserve nitrous oxide and oxygen cylinders, if such gas(es) are used in the facility.

9.9.I.4. Equipment storage room(s) for equipment and supplies used in the procedure suite.

9.9.I.5. Staff clothing change areas. Appropriate change areas shall be provided for staff working within the procedure suite. The areas shall contain lockers, toilets, handwashing stations, and space for changing clothes.

9.9.I.6. Patient clothing change areas. A separate area shall be provided for patients to change from street clothing into hospital gowns and to prepare for procedures. This area shall include lockers, toilet(s), clothing change or gowning area(s), and space for administering medications. Provisions shall be made for securing patients' personal effects.

9.9.I.7. Stretcher storage area. This area shall be convenient for use and out of the direct line of traffic.

9.9.I.8. Lounge and toilet facilities for surgical staff. These shall be provided in facilities having three or more procedure rooms.

9.9.I.9. Housekeeping room. Space containing a floor receptor or service sink and storage space for housekeeping supplies and equipment shall be provided.

9.9.I.10. Space for temporary storage of wheelchairs.

9.9.I.11. Provisions for convenient access to and use of emergency resuscitation equipment and supplies (crash cart(s) and/or anesthesia carts) at both the procedure and recovery areas.

9.9.J. Diagnostic Facilities

Diagnostic services shall be provided on- or off-site for pre-admission tests as required by the functional program.

9.9.K. Details and Finishes

All details and finishes shall meet the standards in Section 9.2.G and below.

9.9.K1. Details shall conform to the following guidelines:

a. Minimum public corridor width shall be 5 feet (1.52 meters), except that corridors where patients are transported on stretchers or beds shall be 8 feet (2.44 meters) wide. Passages and corridors used exclusively for staff access may be 44 inches (1.12 meters) in clear width.

b. The separate facility or section shall comply with the "New Ambulatory Health Care Centers" section of NFPA 101 and as described herein. Where the outpatient endoscopy unit is part of another facility that does not comply with, or exceeds, the fire safety requirements of NFPA 101, there shall be not less than one-hour separation between the outpatient surgical unit and other sections. The outpatient surgical facility shall have not less than two exits to the exterior. Exits, finishes, separation for hazardous areas, and smoke separation shall conform to NFPA 101.

c. Toilet rooms in procedure and recovery areas for patient use shall be equipped with doors and hardware that permit access from the outside in emergencies. When such rooms have only one opening or are small, the doors shall open outward or be otherwise designed to open without pressing against a patient who may have collapsed within the room.

d. Flammable anesthetics shall not be used in outpatient endoscopy facilities.

e. Doors serving occupiable spaces shall have a minimum nominal width of 3 feet (0.91 meter), except doors requiring gurney/stretcher access, which shall have a nominal width of 3 feet, 8 inches (1.12 meters).

9.9.K2. Finishes shall conform to the following guidelines:

a. Ceiling finishes shall be appropriate for the areas in which they are located and shall be as follows:

(1) Ceiling finishes in general areas are optional and may be omitted in mechanical and electrical rooms/spaces unless required for fire-resistive purposes.

(2) Ceiling finishes in procedure rooms, the decontamination room, and other semirestricted areas shall be capable of withstanding cleaning with chemicals, and without crevices that can harbor mold and bacteria growth. If a lay-in ceiling is provided, it shall be gasketed or clipped down to prevent the passage of

particles from the cavity above the ceiling plane into the semirestricted environment. Perforated, tegular, serrated, cut, or highly textured tiles are not acceptable.

b. Wall finishes shall be appropriate for the areas in which they are located and shall be as follows:

(1) Wall finishes shall be cleanable.

(2) Wall finishes in areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms, and minor surgical procedure rooms shall be washable, smooth, and capable of withstanding chemical cleaning.

(3) Wall finishes in areas such as procedure rooms shall be scrubbable, capable of withstanding chemical cleaning, and monolithic.

c. Floor finishes shall be appropriate for the areas in which they are located and shall be as follows:

(1) Floor finishes shall be cleanable.

(2) Floor finishes in areas such as clean corridors and patient care areas shall be washable, smooth, and capable of withstanding chemical cleaning.

(3) Floor finishes in areas such as procedure rooms and the decontamination room shall be scrubbable, capable of withstanding chemical cleaning, and monolithic with an integral base.

9.9.L. Plumbing
See Section 9.31.

9.9.M. Electrical
See Section 9.32.

9.9.N. Fire Alarm System
A manually operated, electrically supervised fire alarm system shall be installed in each facility as described in NFPA 101.

9.9.O. Mechanical
Heating, ventilation, and air conditioning shall be as described for similar areas in Section 9.31 and Table 7.2, except that the recovery lounge need not be considered a sensitive area.

~~**9.9.A. Procedure Room(s)**~~

~~***9.9.A1.** Each procedure room shall have a minimum clear area of 200 square feet (15 square meters) exclusive of fixed cabinets and built-in shelves.~~

~~**9.9.A2.** A freestanding handwashing station with hands-free controls shall be available in the suite.~~

~~**9.9.A3.** Station outlets for oxygen, vacuum (suction), and medical air. See Table 9.2.~~

~~**9.9.A4.** Floor covering shall be monolithic and joint free.~~

~~**9.9.A5.** A system for emergency communication shall be provided.~~

9.9.A6. Procedure rooms shall be designed for visual and acoustical privacy for the patient.

9.9.B. Instrument Processing Room(s)

9.9.B1. Dedicated processing room(s) for cleaning and disinfecting instrumentation must be provided. In an optimal situation, cleaning room(s) should be located between two procedure rooms. However, one processing room may serve multiple procedure rooms. Size of the cleaning room(s) is dictated by the amount of equipment to be processed.

Cleaning rooms should allow for flow of instrumentation from the contaminated area to the clean area, and finally, to storage. The clean equipment rooms, including storage, should protect the equipment from contamination.

9.9.B2. The decontamination room should be equipped with the following:

a. Utility sink(s), as appropriate to the method of decontamination used. This may require soaking sink(s), rinse sink(s), automated cleaning device(s), or a combination.

b. One freestanding handwashing station.

c. Work counter space(s).

d. Space and plumbing fixtures for automatic endoscope cleaners, sonic processor, and flash sterilizers (where required).

e. Ventilation system. Negative pressure shall be maintained and a minimum of 10 air changes per hour shall be maintained. A hood is recommended over the work counter.) All air should be exhausted to the outside to avoid recirculation within the facility.

f. Provision shall be made for vacuum and/or compressed air, as appropriate to cleaning methods used.

g. Floor covering, monolithic and joint free.

9.9.B3. Patient Holding/Prep/Recovery Area

The following elements should be provided in this area:

a. Each patient cubicle shall be provided with oxygen and suction per Table 9.2 and shall meet the size requirements of a step down recovery area, Section 9.5.F3.b., unless general anesthesia is administered, when size shall comply with Section 9.5.F3.c.

b. Cubicle curtains for patient privacy.

c. Medication preparation and storage with handwashing stations.

d. Toilet facilities (may be accessible from patient holding or directly from procedure room(s) or both).

e. Change areas and storage for patients' personal effects.

f. Nurses reception and charting area with visualization of patients.

g. Clean utility room or area.

h. Janitor/housekeeping closet.

9.10 Cough-Inducing and Aerosol-Generating Procedures

Rooms used for sputum induction, aerosolized pentamidine treatments, or other cough-inducing procedures shall meet the requirements of Table 7.2 for airborne infection room ventilation requirements. If booths are used, refer to Section 7.1518.

9.11 Psychiatric Outpatient Center

9.11.A. General
The psychiatric outpatient center provides community outpatient psychiatric services. The number and type of diagnostic, clinical, and administrative areas shall be sufficient to support the services and estimated patient load described in the program. All standards set forth in Sections 9.1 and 9.2 shall be met for psychiatric outpatient centers, with the additions and modifications described herein. In no way are these standards to be interpreted to inhibit placing small neighborhood psychiatric outpatient centers into existing commercial and residential facilities; that is, units with four or fewer employees.

9.11.B. Parking
Parking spaces for patients and family shall be provided to meet the functional program.

9.11.C. Administrative Services
Each psychiatric outpatient center shall make provisions to support administrative activities, filing, and clerical work as appropriate. (See also Section 9.2.A.) Service areas shall include the following:

9.11.C1. Interview space(s) for private interviews related to social service, credit, etc. Interviews may take place in an office or consultation room if the program so indicates.

9.11.C2. Office(s), separate and enclosed, with provisions for privacy.

9.11.C3. Clerical space or rooms for typing and clerical work separated from public areas to ensure confidentiality.

9.11.C4. Records room(s) with filing and storage for the safe and secure storage of patient records with provisions for ready retrieval.

9.11.C5. Office supply storage (closets or cabinets) within or convenient to administrative services.

9.11.C6. A staff toilet and lounge in addition to and separate from public and patient facilities.

9.11.C7. Multiuse room(s) for conferences, meetings, and health education. One room may be primarily for staff use but also available for public access as needed. If the program so indicates, these functions may take place in group room(s).

9.11.D. Public Areas
Public areas shall be situated for convenient access and designed to promote prompt accommodation of

patient needs, with consideration for personal dignity.

9.11.D1. Entrances shall be well marked, at grade level and secured at least at the psychiatric outpatient unit. Where entrance lobby and/or elevators are shared with other tenants, travel to the psychiatric outpatient unit shall be direct and accessible to the disabled. Except for passage through common doors, lobbies, or elevator stations, patients shall not be required to go through other occupied areas or outpatient service areas. Entrance shall be convenient to parking and available via public transportation.

9.11.D2. A reception and information counter or desk shall be located to provide visual control of the entrance to the psychiatric outpatient unit and shall be immediately apparent from that entrance.

9.11.D3. The waiting area for patients and escorts shall be under staff control. The seating shall contain not less than two spaces for consultation room and not less than 1.5 spaces for the combined projected capacity at one time of the group rooms. Where the psychiatric outpatient unit has a formal pediatrics service, a separate, controlled area for pediatric patients shall be provided. The waiting area shall accommodate wheelchairs.

9.11.D4. Toilet(s) for public use shall be immediately accessibly to the waiting area. In smaller units, the toilet may be unisex.

9.11.D5. Drinking fountains shall be available for waiting patients. In shared facilities, drinking fountains may be outside the outpatient area if convenient for use.

9.11.D6. A control counter (may be part of the reception, information, and waiting room control) shall have access to patient files and records for scheduling of services.

9.11.E. Diagnostic Services
Facilities shall be provided only for those services specified in the functional program. Facilities provided shall meet the requirements of the specific diagnostic service and the standards set forth in Section 9.31.

9.11.F. Clinical Services
Facilities shall be provided only for those services specified in the functional program. Following are service areas that shall be strongly considered in any psychiatric outpatient center:

9.11.F1. Consultation room(s).

9.11.F2. Small group room(s).

9.11.F3. Large group room(s). These may also be used for activities.

9.11.F4. Observation room(s). See Section 9.2.B4.

9.11.F5. Nurses' station(s). See Section 9.2.B5.

9.11.F6. Drug distribution center. See Section 9.2.B6.

9.11.F7. Kitchenette(s). These may be located by the large group room(s).

9.11.F8. Clean storage. See Section 9.2.B7.

9.11.F9. Soiled holding. See Section 9.2.B8.

9.11.F10. Wheelchair storage space. See Section 9.2.B10.

9.11.G. Staff Facilities
Centralized staff facilities are not required in small centers; see Section 9.11.C6.

9.11.H. Details and Finishes
The standards set forth in Section 9.2.G shall be met with the additions and modifications described herein:

9.11.H1. The level of patient safety and security shall be set by the owner in their program.

9.11.H2. There shall be observation on all public areas including corridors; this can be accomplished by electronic surveillance if it is not obtrusive. Niches and hidden areas in corridors shall be prohibited.

9.11.H3. If the functional program determines suicide or staff safety risks are present, ceilings, walls, floors, windows, etc., shall be tamper-resistant in patient treatment areas. In addition, any rods, doors, grab bars, handrails, etc., shall be constructed so they do not allow attempts at suicide and cannot be used as weapons.

9.11.H4. Cubicle curtains and draperies shall not be used where risk assessment of the functional program dictates.

9.12 Renal Dialysis (Acute and Chronic) Center

9.12.A. General

9.12.A1. The number of dialysis stations shall be based upon the functional program and may include several work shifts per day.

9.12.A2. The location shall offer convenient access for outpatients. Accessibility to the unit from parking and public transportation shall be a consideration.

9.12.A3. Space and equipment shall be provided as necessary to accommodate the functional programs, which may include outpatient dialysis, home treatment support, and dialyzer reuse.

9.12.B. Treatment Area

9.12.B1. The treatment area may be an open area and shall be separate from administrative and waiting areas.

9.12.B2. Nurses' station(s) shall be located within the dialysis treatment area and designed to provide visual observation of all patient stations.

9.12.B3. Individual patient treatment areas shall contain at least 80 square feet (7.44 square meters). There shall be at least a 4-foot (1.22-meter) space between beds and/or lounge chairs.

9.12.B4. Handwashing stations shall be convenient to the nurses' station and patient treatment areas. There shall be at least one handwashing station serving no more than four stations. These shall be uniformly distributed to provide equal access from each patient station.

9.12.B5. The open unit shall be designed to provide privacy for each patient.

9.12.B6. The number of and need for required airborne infection isolation rooms shall be determined by an ICRA. Where required, the airborne infection isolation room(s) shall comply with the requirements of Section 7.2.C.

9.12.B7. If required by the functional program, there shall be a medication dispensing station for the dialysis center. A work counter and handwashing stations shall be included in this area. Provisions shall be made for the controlled storage, preparation, distribution, and refrigeration of medications.

9.12.B8. If home training is provided in the unit, a private treatment area of at least 120 square feet (11.15 square meters) shall be provided for patients who are being trained to use dialysis equipment at home. This room shall contain counter, handwashing stations, and a separate drain for fluid disposal.

9.12.B9. An examination room with handwashing stations and writing surface shall be provided with at least 100 square feet (9.29 square meters).

9.12.B10. A clean workroom shall be provided. If the room is used for preparing patient care items, it shall contain a work counter, a handwashing station, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and handwashing station may be omitted. Soiled and clean workrooms or holding rooms shall be separated and have no direct connection.

9.12.B11. A soiled workroom shall be provided and contain a flushing-rim sink, handwashing station, work counter, storage cabinets, waste receptacles, and a soiled linen receptacle.

9.12.B12. If dialyzers are reused, a reprocessing room shall be provided and sized to perform the functions required. It shall include one-way flow of materials from soiled to clean with provisions for a refrigeration (temporary storage or dialyzer) decontamination/cleaning areas, sinks processors, computer processors and label printers, packaging area, and dialyzer storage cabinets.

9.12.B13. If a nourishment station for the dialysis service is provided, it shall contain a sink, a work counter, a refrigerator, storage cabinets, and equipment for serving nourishments as required.

9.12.B14. An environmental services closet shall be provided adjacent to and for the exclusive use of the unit. The closet shall contain a floor receptor or service sink and storage space for housekeeping supplies and equipment.

9.12.B15. If required by the functional program, an equipment repair and breakdown room shall be equipped with a handwashing station, deep service sink, work counter, and storage cabinet.

9.12.B16. Supply areas or supply carts shall be provided.

9.12.B17. Storage space shall be available for wheelchairs and stretchers, if stretchers are provided, out of direct line of traffic.

9.12.B18. If blankets or other linen is used, a clean linen storage area shall be provided. This may be within the clean workroom, a separate closet, or an approved distribution system. If a closed cart system is used, storage may be in an alcove. It must be out of the path of normal traffic and under staff control.

9.12.B19. Each facility using a central batch delivery system shall provide, either on the premises or through written arrangements, individual delivery systems for the treatment of any patient requiring special dialysis solutions. The mixing room shall also include a sink, storage space, and holding tanks.

9.12.B20. The water treatment equipment shall be located in an enclosed room.

9.12.B21. A patient toilet with handwashing stations shall be provided.

***9.12.B22.** Piping.
All dialysis system piping shall be readily accessible for inspection and maintenance. Design consideration shall be given to the disposal of liquid waste from the dialyzing process to prevent odor and backflow.

9.12.C. Ancillary Facilities

9.12.C1. Appropriate area(s) shall be available for staff clothing change area and lounge. The area shall contain lockers, shower, toilet, and handwashing stations.

9.12.C2. Storage for patients' belongings shall be provided.

9.12.C3. A waiting room, toilet room with handwashing stations, drinking fountain, public telephone, and seating accommodations for waiting periods shall be available or accessible to the dialysis unit.

9.12.C4. Office and clinical work space shall be available for administrative services.

9.13 Office Surgical Facility

9.13.A. Definitions
An outpatient surgical facility is an outpatient facility that has within it physician office(s) and space(s) for the performance of invasive procedures. Facilities that may have more than three patients rendered incapable of self-preservation without assistance from others shall meet requirements of Section 9.5.

9.13.B. Size
The number and type of diagnostic, clinical, and administrative facilities to be provided will be determined by the services contemplated and the estimated patient load as described in the functional program.

9.13.C. Sterilizing Facilities
A system for sterilizing equipment and supplies shall be provided. When sterilization is provided off site, adequate handling (receiving and distribution) and on-site storage of sterile supplies must be accommodated and shall meet the minimum requirements for on-site facilities. Provisions shall be made for the cleaning and sanitizing of clean and soiled carts and vehicles transporting supplies.

If on-site processing facilities are provided, they shall include the following:

9.13.C1. Soiled workroom. This room shall be physically separated from all other areas of the facility. Workspace shall be provided to handle the cleaning and the gross cleaning, debridement, and disinfections of all medical/surgical instruments and equipment. The soiled workroom shall contain work surfaces(s), sink(s), and washer/sterilizer decontaminators, flush-type devices(s), or other decontamination equipment as appropriate to the functional program.

9.13.C2. Clean/assembly workroom. This workroom shall have a handwashing station and shall contain appropriate and sufficient work space and equipment for terminal sterilizing of medical and surgical equipment and supplies. Clean and soiled work areas shall be physically separated. The clean assembly room shall have adequate space for the designated number of work areas as defined in the functional program.

9.13.C3. Clean/sterile supplies. Storage for packs, etc., shall include provisions for ventilation, humidity, and temperature control. A system for sterilizing equipment and supplies shall be provided. When sterilization is provided off site, adequate handling and on-site storage of sterile supplies shall be provided. Provision shall be made for cleaning and sanitizing of carts and vehicles used for transporting supplies.

Space shall be provided for handling and storage of soiled materials and equipment separate from areas designated for storage of clean and sterile materials and equipment. Appropriate receptacles for biohazardous waste shall be provided, and these shall be placed in the designated soiled storage area.

9.13.D. Clinical Facilities

9.13.D1. Operating rooms. Each facility shall have at least one operating room. Operating rooms shall have a minimum clear floor area of 150 square feet (45.72 meters) and a minimum clear dimension of 10 feet (3.04 meters). There shall be a minimum clear distance of 3 feet (0.91 meter) at the head, at the foot, and at each side of the operating table.

9.13.D2. Post-operative recovery. Post-operative recovery may be conducted in the operating room or in a specifically designated space. An operating room may be used by no more than one patient at a time. If located in a specifically designated space, the following shall be provided:

a. The recovery station shall be located in direct visual contact with a nurse station.

b. Cubicle curtains or other provisions for privacy during post-operative care shall be provided.

9.13.D3. Support facilities. The following shall be immediately accessible to the aaoperating room(s):

a. Space for crash cart, including outlets for battery charging.

b. Hands-free scrub station(s) outside of but near the entrance to each operating room. One scrub station may service two operating rooms if needed. Scrub station(s) shall be arranged to minimize incidental splatter on nearby personnel or supply carts. The scrub station may be used for the handwashing station requirements of immediately adjacent area(s).

c. Drug distribution station. Provisions shall be made for storage and preparation of medications administered to patients. A refrigerator for pharmaceuticals and double-locked storage for controlled substances shall be provided. Convenient access to handwashing stations shall be provided.

d. Soiled handling/storage area, including provision for disposal of fluid waste.

e. Clean storage area, including space for preparing instruments and supplies for surgery.

f. Medical gas supply.

g. Staff clothing change area

9.13.E. Details and Finishes

9.13.E1. Items such as drinking fountains, telephone booths, vending machines, etc., shall not restrict corridor traffic or reduce the corridor width below the required minimum. Out-of-traffic storage space for portable equipment shall be provided.

9.13.E2. The minimum nominal door width for patient use shall be 3 feet (0.91 meter) except that doors requiring gurney/stretcher access (as defined by the functional program) shall have a nominal width of 44 inches (1.11 meters).

9.13.E3. Toilet room doors for patient use shall open outward or be equipped with hardware that permits access from the outside in emergencies.

9.13.E4. Wall bases in operating rooms and areas that are frequently subject to wet cleaning shall be monolithic and coved directly up from the floor, tightly sealed to the wall, and constructed without voids. Seam welds in sheet flooring shall utilize manufacturer's weld product recommendations. Vinyl composition tile (VCT) or similar products shall not be permitted in these areas.

9.13.E5. Floor and wall areas penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of rodents and insects.

9.13.E6. Wall finishes in operating room(s) shall be scrubbable, able to withstand harsh chemical cleaning, and monolithic.

9.13.E7. Ceiling finishes in general areas are optional and may be omitted in mechanical and electrical rooms/spaces unless required for fire-resistive purposes.

9.13.E8. Ceiling finishes in operating rooms shall be smooth, washable, nonabsorptive, nonperforated, able to withstand cleaning with chemicals, and without crevices that can harbor mold and bacteria growth. If a lay-in ceiling is provided, it shall be gasketed or clipped down to prevent the passage of particles from the cavity above the ceiling plane into the semirestricted environment. Perforated, tegular, serrated, cut, or highly textured tiles shall not be permitted.

9.14-9.29 Reserved

9.30 Special Systems

9.30.A. General

9.30.A1. Prior to acceptance of the facility, all special systems shall be tested and operated to demonstrate to the owner or his designated representative that the installation and performance of these systems conform to design intent. Test results shall be documented for maintenance files.

9.30.A2. Upon completion of the special systems equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions, a parts lists, and complete procurement information, including equipment numbers and descriptions. Operating staff persons shall also be provided with instructions for proper operation of systems and equipment. Required information shall include all safety or code ratings as needed.

9.30.A3. Insulation shall be provided surrounding special system equipment to conserve energy, protect

personnel, and reduce noise.

9.30.B. Elevators

9.30.B1. Installation and testing of elevators shall comply with ANSI/ASME A17.1 for new construction and ANSI/ASME A17.3 for existing facilities. (See ASCE 7-93 for seismic design and control systems requirements for elevators.)

a. Cars shall have a minimum inside floor dimension of not less than 5 feet (1.52 meters).

b. Elevators shall be equipped with a two-way automatic level-maintaining device with an accuracy of ±1/2 inch (±12.7 millimeters).

c. Elevator call buttons and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors. This is so that the light control feature will be overridden or disengaged should it encounter smoke at any landing.

d. Elevator controls, alarm buttons, and telephones shall be accessible to wheelchair occupants and usable by the blind.

9.30.B2. Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this section as well as all applicable safety regulations and codes.

9.30.C. Waste Processing Services

9.30.C1. Storage and disposal. Facilities shall be provided for sanitary storage and treatment or disposal of waste using techniques acceptable to the appropriate health and environmental authorities. The functional program shall stipulate the categories and volumes of waste for disposal and shall stipulate the methods of disposal for each.

9.30.C2. Medical waste. Medical waste shall be disposed of either by incineration or other approved technologies. Incinerators or other major disposal equipment may be shared by two or more institutions.

a. Incinerators or other major disposal equipment may also be used to dispose of other medical waste where local regulations permit. Equipment shall be designed for the actual quantity and type of waste to be destroyed and should meet all applicable regulations.

b. Incinerators with 50-pounds-per-hour or greater capacities shall be in a separate room or outdoors; those with lesser capacities may be located in a separate area within the facility boiler room. Rooms and areas containing incinerators shall have adequate space and facilities for incinerator charging and cleaning, as well as necessary clearances for work and maintenance. Provisions shall be made for operation, temporary storage, and disposal of materials so that odors and fumes do not drift back into occupied areas. Existing approved incinerator installations, which are not in separate rooms or outdoors, may remain unchanged provided they meet the above criteria.

c. The design and construction of incinerators and trash chutes shall comply with NFPA 82.

*d. Recovery of waste heat. See appendix.

*e. Environmental/health risk assessments for permit applications. See appendix.

9.30.C3. Nuclear ~~W~~waste ~~D~~disposal. See *Code of Federal Regulations*, title X, parts 20 and 35, concerning the handling and disposal of nuclear materials in health care facilities.

9.31 Mechanical Standards

Note: These requirements do not apply to small primary (neighborhood) outpatient facilities or outpatient facilities that do not perform invasive applications or procedures. See Section 9.4.I.

9.31.A. General

***9.31.A1.** The mechanical system ~~should~~ shall be designed for overall efficiency and life cycle costing. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually. Recognized engineering procedures shall be followed for the most economical and effective results. A well-designed system can generally achieve energy efficiency at minimal additional cost and simultaneously provide improved patient comfort. Different geographic areas may have climatic and use conditions that favor one system over another in terms of overall cost and efficiency. In no case shall patient care or safety be sacrificed for conservation.

~~Mechanical, electrical, and HVAC equipment may be located either internally, externally, or in separate buildings.~~

~~**9.31.A2.** Remodeling and work in existing facilities may present special problems. As practicality and funding permit, existing insulation, weather stripping, etc., should be brought up to standard for maximum economy and efficiency. Consideration shall be given to additional work that may be needed to achieve this.~~

~~Insofar as practical, the facility should include provisions for recovery of waste cooling and heating energy (ventilation, exhaust, water and steam discharge, cooling towers, incinerators, etc.).~~

~~Facility design consideration shall include recognized energy-saving mechanisms such as variable- air-volume systems, load shedding, programmed controls for unoccupied periods (nights and weekends, etc.), and use of natural ventilation, site and climatic conditions permitting. Systems with excessive installation and/or maintenance costs that negate long-range energy savings should be avoided.~~

~~Use of mechanically circulated outside air does not reduce the need for filtration.~~

9.31.A2~~3~~. Facility design consideration shall include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.

~~**9.31.A4.** Insofar as practical, the facility should include provisions for recovery of waste cooling and heating energy (ventilation, exhaust, water and steam discharge, cooling towers, incinerators, etc.).~~

~~**9.31.A5.** Facility design consideration shall include recognized energy-saving mechanisms such as variable- air- volume systems, load shedding, programmed controls for unoccupied periods (nights and weekends, etc.), and use of natural ventilation, site and climatic conditions permitting. Systems with excessive installation and/or maintenance costs that negate long-range energy savings should be avoided.~~

*9.31.A3~~6~~.** Air-handling systems shall be designed with an economizer cycle where appropriate to use outside air. ~~(Use of mechanically circulated outside air does not reduce~~ the ~~need for filtration.)~~

~~It may be practical in many areas to reduce or shut down mechanical ventilation during appropriate climatic and patient care conditions and to use open windows for ventilation.~~

9.31.A~~7~~4. Mechanical equipment, ductwork, and piping shall be mounted on vibration isolators as required to prevent unacceptable structure-borne vibration.

9.31.A~~8~~5. Supply and return mains and risers for cooling, heating, and steam systems shall be equipped with valves to isolate the various sections of each system. Each piece of equipment shall have valves at the supply and return ends.

9.31.A~~9~~6. Upon completion of the equipment~~-~~ installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions, ~~a~~ parts lists, and complete procurement information, including equipment numbers and descriptions. Operating staff persons shall also be provided with instructions for properly operating systems and equipment. Required information shall include energy ratings as needed for future conservation calculations.

9.31.B. Thermal and Acoustical Insulation

9.31.B1. Insulation within the building shall be provided to conserve energy, protect personnel, prevent vapor condensation, and reduce noise.

9.31.B2. Insulation on cold surfaces shall include an exterior vapor barrier. (Material that will not absorb or transmit moisture ~~will~~ shall not require a separate vapor barrier.)

9.31.B3. Insulation, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less as determined by an independent testing laboratory in accordance with NFPA 255.

9.31.B4. If duct lining is used, it shall be coated and sealed, and shall meet ASTM C1071. These linings (including coatings, adhesives, and exterior surface insulation on pipes and ducts in spaces used as air supply plenums) shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less~~,~~ as determined by an independent testing laboratory in accordance with NFPA 255. If existing lined ductwork is reworked in a renovation project, the liner seams and punctures shall be resealed.

9.31.B5. Duct linings exposed to air movement shall not be used in ducts serving operating rooms, delivery rooms, LDR rooms, and critical care units. This requirement shall not apply to mixing boxes and acoustical traps that have special coverings over such lining.

9.31.B6. Existing accessible insulation within areas of facilities to be modernized shall be inspected, repaired, and/or replaced, as appropriate.

9.31.B7. Duct lining shall not be installed within 15 feet (4.57 meters) downstream of humidifiers.

9.31.B8. All return air ventilation systems in patient care areas of outpatient surgery facilities shall be ducted.

9.31.C. Steam and Hot Water Systems

9.31.C1. Boilers shall have the capacity, based upon the net ratings published by the Hydronics Institute or another acceptable national standard, to supply the normal heating, hot water, and steam requirements of all systems and equipment. Their number and arrangement shall accommodate facility needs despite the breakdown or routine maintenance of any one boiler. The capacity of the remaining boiler(s) shall be sufficient to provide hot water service for clinical, dietary, and patient use; steam for sterilization and dietary purposes; and heating for operating, delivery and birthing, labor, recovery, and intensive care. However, reserve capacity for facility space heating is not required in geographic areas where a design dry-bulb temperature of 25°F (-4°C) or more represents not less than 99 percent of the total hours in any one heating month as noted in ASHRAE's *Handbook of Fundamentals* under the "Table for Climatic Conditions for the United States."

9.31.C2. Boiler accessories, including feed pumps, heat-circulating pumps, condensate return pumps, fuel oil pumps, and waste heat boilers, shall be connected and installed to provide both normal and standby service.

9.31.D. Heating, Ventilation, and Air Conditioning~~, Heating, and Ventilation~~ Systems

9.31.D1. All rooms and areas in the facility used for patient care shall have provisions for ventilation. The ventilation rates shown in Table 7.2 shall be used only as minimum standards; they do not preclude the use of higher, more appropriate rates. ~~T~~Although natural window ventilation for nonsensitive and patient areas may be employed, weather permitting, availability of mechanical ventilation ~~should~~ shall be considered for use in interior areas and during periods of temperature extremes. Fans serving exhaust systems shall be located at the discharge end and shall be readily serviceable. Air supply and exhaust in rooms for which no minimum total air change rate is noted may vary down to zero in response to room load. For rooms listed in Table 7.2, where VAV systems are used, minimum total air change shall be within limits noted. ~~Temperature control shall also comply with these standards.~~ Space temperature and relative humidity shall be as indicated in Table 7.2. To maintain asepsis control, airflow supply and exhaust ~~should~~ shall ~~generally~~ be controlled to ensure general movement of air from "clean" to "less clean" areas, especially in critical areas. The ventilation systems shall be designed and balanced according to the requirements ~~shown~~ in Table 7.2 and in the applicable notes.

For renovation projects, prior to the start of construction and preferably during design, airflow and static pressure measurements shall be taken at the connection points of new ductwork to existing systems. This information shall be used by the designer to determine if existing systems have sufficient capacity for intended new purposes, and so any required modifications to the existing system can be included in the design documentation.

9.31.D2. ~~General exhaust systems may be combined to enhance the efficiency of recovery devices required for energy conservation. Local exhaust systems shall be used whenever possible in place of dilution ventilation to reduce exposure to hazardous gases, vapors, fumes, or mists.~~Exhaust systems may be combined to enhance the efficiency of recovery devices required for energy conservation. Local exhaust systems shall be used whenever possible in place of dilution ventilation to reduce exposure to hazardous gases, vapors, fumes, or mists. Airborne infection isolation rooms shall not be served by exhaust systems incorporating a heat wheel.

Exhaust outlets from areas that may be contaminated shall be above roof level, arranged to minimize recirculation of exhaust air into the building, and directed away from personnel service areas.

9.31.D3. Fresh air intakes shall be located at least 25 feet (7.62 meters) from exhaust outlets of

ventilating systems, combustion equipment stacks, medical-surgical vacuum systems, plumbing vents, or areas that may collect vehicular exhaust or other noxious fumes. (Prevailing winds and/or proximity to other structures may require greater clearances.) Plumbing and vacuum vents that terminate at a level above the top of the air intake may be located as close as 10 feet (3.05 meters). The bottom of outdoor air intakes serving central systems shall be as high as practical, but at least 6 feet (1.83 meters) above ground level, or, if installed above the roof, 3 feet (0.91 meter) above roof level. ~~Exhaust outlets from areas that may be contaminated shall be above roof level, arranged to minimize recirculation of exhaust air into the building, and directed away from personnel service areas.~~ The requirement for a 25-foot (7.62-meter) separation also pertains to the distance between the intake and the exhaust and/or gas vent off of packaged rooftop units.

9.31.D4. In new construction and major renovation work, air supply for operating rooms shall be from ceiling outlets near the center of the work area. Return air shall be near the floor level, at a minimum. Return air shall be permitted high on the walls, in addition to the low returns. Each operating and delivery room shall have at least two return-air inlets located as ~~remotely~~ far from each other as practical. ~~(Design should consider t~~Turbulence and other factors of air movement shall be considered to minimize the fall of particulates onto sterile surfaces.~~)~~ Temperature shall be individually controlled for each operating room. During unoccupied hours, operating room air change rates may be reduced, provided that the positive room pressure is maintained as required in Table 7.2. Operating room ventilation systems shall operate at all times, except during maintenance and conditions requiring shutdown by the building's fire alarm system.

9.31.D5. ~~Air supply for rooms used for invasive procedures shall be at or near the ceiling. Return or exhaust air inlets shall be near the floor level. Exhaust grills for anesthesia evacuation and other special applications shall be permitted to be installed in the ceiling.~~ Where anesthesia scavenging systems are required by Section 9.31.D6, air supply shall be at or near the ceiling. Return or exhaust air inlets shall be near the floor level.

***9.31.D6.** Each space routinely used for administering inhalation anesthesia and inhalation analgesia shall be served by a scavenging system to vent waste gases. If a vacuum system is used, the gas-collecting system shall be arranged so that it does not disturb patients' respiratory systems. Gases from the scavenging system shall be exhausted directly to the outside. The anesthesia evacuation system may be combined with the room exhaust system, provided that the part used for anesthesia gas scavenging exhausts directly to the outside and is not part of the recirculation system. Scavenging systems are not required for areas where gases are used only occasionally, such as the emergency department, offices for routine dental work, etc. Acceptable concentrations of anesthetizing agents are unknown at this time. The absence of specific data makes it difficult to set specific standards. However, any scavenging system should be designed to reduce ambient concentrations of waste gases to safe levels. See appendix for additional information. It is assumed that anesthetizing equipment will be selected and maintained to minimize leakage and contamination of room air.

9.31.D7. The bottoms of ventilation (supply/return) openings shall be at least 3 inches (76.2 millimeters) above the floor.

9.31.D8. All central ventilation or air conditioning systems shall be equipped with filters with efficiencies equal to, or greater than, those specified in Table 9.1. Where two filter beds are required, filter bed no. 1 shall be located upstream of the air conditioning equipment and filter bed no. 2 shall be downstream of any fan or blowers. Filter efficiencies, tested in accordance with ASHRAE 52.1-1992, shall be average. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing duct work. All joints between filter segments and enclosing duct~~-~~work shall have gaskets or seals to provide a positive seal against air leakage. A manometer shall be installed across each filter bed having a required efficiency of

75 percent or more, including hoods requiring HEPA filters. Provisions shall be made to allow access for field testing.

***9.31.D9.** If duct humidifiers are located upstream of the final filters, they shall be ~~located~~ at least 15 feet (4.57 meters) upstream of the final filters. Ductwork with duct-mounted humidifiers shall have a means of water removal. An adjustable high-limit humidistat shall be located downstream of the humidifier to reduce the potential ~~of~~ for condensation ~~moisture condensing~~ inside the duct. Humidifiers shall be connected to airflow proving switches that prevent humidification unless the required volume of airflow is present or high~~-~~-limit humidistats are provided. All duct takeoffs ~~should~~ shall be sufficiently downstream of the humidifier to ensure complete moisture absorption. Steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.

9.31.D10. Air-handling duct systems shall be designed with accessibility for duct cleaning~~,~~ and shall meet the requirements of NFPA 90A.

9.31.D11. Ducts that penetrate construction intended to protect against ~~X~~x-ray, magnetic, RFI, or other radiation shall not impair the effectiveness of the protection.

9.31.D12. Fire and smoke dampers shall be constructed, located, and installed in accordance with the requirements of NFPA 101, 90A, and the specific damper's ~~L~~listing requirements. Fans, dampers, and detectors shall be interconnected so that damper activation will not damage ducts. Maintenance access shall be provided at all dampers. All damper locations ~~should~~ shall be shown on design drawings. Dampers ~~should~~ shall be activated ~~by fire or smoke sensors~~in accordance with NFPA 90A~~, not by fan cutoff alone~~. Switching systems for restarting fans may be installed for fire department use in venting smoke after a fire has been controlled. However, provisions should be made to avoid possible damage to the system due to closed dampers. When smoke partitions are required, heating, ventilation, and air conditioning zones shall be coordinated with compartmentation insofar as practical to minimize need to penetrate fire and smoke partitions.

9.31.D13. Hoods and safety cabinets may be used for normal exhaust of a space provid~~ing~~ed minimum air change rates are maintained. If air change standards in Table 7.2 do not provide sufficient air for proper operation of exhaust hoods and safety cabinets (when in use), makeup air (filtered and preheated) ~~should~~ shall be provided around these units to maintain the required airflow direction and exhaust velocity. Use of makeup air will avoid dependence upon infiltration from outdoor and/or from contaminated areas. Makeup systems for hoods shall be arranged to minimize "short circuiting" of air and to avoid reduction in air velocity at the point of contaminant capture.

9.31.D14. Laboratory fume hoods shall meet the following general standards:

a. Have an average face~~-~~ velocity of at least 90 to 110 feet per minute (0.45 to 0.56 meters per second).

b. Be connected to an exhaust system to the outside ~~which~~ that is separate from the building exhaust system.

c. Have an exhaust fan located at the discharge end of the system.

d. Have an exhaust duct system of noncombustible corrosion-resistant material as needed to meet the planned usage of the hood.

9.31.D15. Laboratory hoods shall meet the following special standards:

a. Fume hoods, and their associated equipment in the air stream, intended for use with perchloric acid and other strong oxidants, shall be constructed of stainless steel or other material consistent with special exposures, and be provided with a water wash and drain system to permit periodic flushing of duct and hood. Electrical equipment intended for installation within such ducts shall be designed and constructed to resist penetration by water. Lubricants and seals shall not contain organic materials. When perchloric acid or other strong oxidants are only transferred from one container to another, standard laboratory fume hoods and the associated equipment may be used in lieu of stainless steel construction.

b. In new construction and major renovation work, each hood used to process infectious or radioactive materials shall have a minimum face velocity of 90 to 110 feet per minute (0.45 to 0.56 meters per second) with suitable pressure-independent air-modulating devices and alarms to alert staff of fan shutdown or loss of airflow. Each shall also have filters with a 99.97 percent efficiency ~~[~~(based on the ~~dioctyl phthalate~~ ~~(~~DOP~~)~~ test method~~]~~) in the exhaust stream, and be designed and equipped to permit the safe removal, disposal, and replacement of contaminated filters. Filters shall be as close to the hood as practical to minimize duct contamination. Fume hoods intended for use with radioactive isotopes shall be constructed of stainless steel or other material suitable for the particular exposure and shall comply with NFPA 801, *Facilities for Handling Radioactive Materials*. **Note**: Radioactive isotopes used for injections, etc., without probability of airborne particulates or gases may be processed in a clean-workbench-type hood where acceptable to the Nuclear Regulatory Commission.

9.31.D16. Exhaust hoods handling grease-laden vapors in food preparation centers shall comply with NFPA 96. All hoods over cooking ranges shall be equipped with grease filters, fire extinguishing systems, and heat-actuated fan controls. Cleanout openings shall be provided every 20 feet (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. Each horizontal duct run shall have at least one cleanout opening. ~~(~~Horizontal runs of ducts serving range hoods ~~should~~ shall be kept to a minimum.~~)~~

9.31.D17. The ventilation system for anesthesia storage rooms shall conform to the requirements of NFPA 99, including the gravity option. Mechanically operated air systems are optional in this room.

9.31.D18. The ventilation system for the space that houses ~~ethylene oxide (~~ETO~~)~~ sterilizers should be designed to:

a. Provide a dedicated (not connected to a return air or other exhaust system) exhaust system. Refer to 29 CFR Part 1910.1047.

b. All source areas shall be exhausted, including the sterilizer equipment room, service/aeration areas, over the sterilizer door, and the aerator. If the ETO cylinders are not located in a well-ventilated, unoccupied equipment space, an exhaust hood shall be provided over the cylinders. The relief valve shall be terminated in a well-ventilated, unoccupied equipment space, or outside the building. If the floor drain to which the sterilizer(s) discharges ~~to~~ is not located in a well-ventilated, unoccupied equipment space, an exhaust drain cap shall be provided (coordinate with local codes).

c. Ensure that general airflow is away from sterilizer operator(s).

d. Provide a dedicated exhaust duct system for ETO. The exhaust outlet to the atmosphere ~~should~~ shall be at least 25 feet (7.62 meters) away from any air intake.

e. Provide ~~A~~an audible and ~~visual~~ visible alarm that shall activate in the sterilizer work area, and in a 24-

hour staffed location, upon loss of airflow in the exhaust system.

9.31.D19. Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit workstation temperatures.

9.31.D20. Gravity exhaust may be used, where conditions permit, for nonpatient areas such as boiler rooms, central storage, etc.

9.31.D21. The energy-saving potential of variable air volume systems is recognized, and the~~se~~ standards herein are intended to maximize appropriate use of ~~that~~ such systems. Any system ~~utilized~~ used for occupied areas shall include provisions to avoid air stagnation in interior spaces where thermostat demands are met by temperatures of surrounding areas.

9.31.D22. Rooms used for sputum induction, aerosolized pentamidine treatments, or other cough-inducing procedures shall meet the requirements of Table 7.2 for airborne infection isolation rooms. If booths are used, refer to section 7.~~15~~18.E.

9.31.D23. Non~~-~~central air handling systems, i.e., individual room units that are used for heating and cooling purposes (fan-coil units, heat pump units, etc.) shall be equipped with permanent (cleanable) or replaceable filters. The filters shall have a minimum efficiency of 68 percent weight arrestance (MERV 3). These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air handling system with the proper filtration, as noted in Table 9.1.

9.31.D24. Rooms where gluteraldehyde is used shall be maintained at a negative pressure with respect to surrounding areas, unless dictated otherwise for specific rooms in Table 7.2. In lieu of special ventilation, a certified, filtered recirculating hood designed for gluteraldehyde shall be permitted.

9.31.E. Plumbing and Other Piping Systems

Unless otherwise specified herein, all plumbing systems shall be designed and installed in accordance with *National Standard Plumbing Code*.

9.31.E1. The following standards shall apply to plumbing fixtures:

a. The material used for plumbing fixtures shall be nonabsorptive and acid-resistant.

b. Water spouts used in lavatories and sinks shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc.

c. General handwashing stations used by medical and nursing staff, ~~and all lavatories used by~~ patients, and food handlers shall be trimmed with valves that can be operated without hands. ~~(~~Single-lever or wrist blade devices shall be permitted.~~may be used.)~~ Blade handles used for this purpose shall not exceed 4-1/2 inches (114.3 millimeters) in length. Handles on clinical sinks shall be at least 6 inches (152.4 millimeters) long. Freestanding scrub sinks and lavatories used for scrubbing in procedure rooms shall be trimmed with foot, knee, or ultrasonic controls; ~~(no~~ single-lever wrist blades are not permitted~~)~~.

d. Clinical sinks shall have an integral trap wherein the upper portion of the water trap provides a visible seal.

e. Showers and tubs shall have nonslip walking surfaces.

9.31.E2. The following standards shall apply to potable water supply systems:

a. Systems shall be designed to supply water at sufficient pressure to operate all fixtures and equipment during maximum demand. Supply capacity for hot- and cold-water piping shall be determined on the basis of fixture units, using recognized engineering standards. ~~When~~ Where the ratio of plumbing fixtures to occupants is proportionally more than required by the building occupancy and is in excess of 1,000 plumbing fixture units, a diversity factor is permitted.

b. Each water service main, branch main, riser, and branch to a group of fixtures shall have valves. Stop valves shall be provided for each fixture. Appropriate panels for access shall be provided at all valves where required.

c. Vacuum breakers or backflow prevention devices shall be installed on hose bibs and supply nozzles used for connection of hoses or tubing in laboratories, housekeeping sinks, ~~bedpan flushing attachments, and autopsy tables,~~ etc.

~~d. Bedpan flushing devices (may be cold water) shall be provided in each inpatient toilet room; however, installation is optional in psychiatric and alcohol abuse units where patients are ambulatory.~~

~~e~~d. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.

e. Systems shall be protected against cross-connection in accordance with American Water Works Association (AWWA) Recommended Practice for Backflow Prevention and Cross-connection Control.

f. Emergency eyewash and showers shall comply with ANSI Z358.1.

9.31.E3. The following standards shall apply to hot water systems:

a. The water-heating system shall have sufficient supply capacity at the temperatures and amounts indicated in Table 7.4. Water temperature is measured at the point of use or inlet to the equipment. Water ~~shall be permitted to~~may be stored at higher temperatures.

b. Hot-water distribution systems serving patient care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet. Non-recirculated fixture branch piping shall not exceed 25 feet (7.62 meters) in length.

*c. Provisions shall be included in the domestic hot water system to limit the amount of *Legionella* bacteria and opportunistic waterborne pathogens.

d. Dead-end piping (risers with no flow, branches with no fixture) shall not be installed. In renovation projects, dead-end piping shall be removed. Empty risers, mains, and branches installed for future use shall be permitted.

9.31.E4. The following standards shall apply to drainage systems:

a. Drain lines from sinks used for acid waste disposal shall be made of acid-resistant material.

b. Drain lines serving some types of automatic blood-cell counters ~~must~~ shall be of carefully selected material that will eliminate the potential for undesirable chemical reactions (and/or explosions) between sodium azide wastes and copper, lead, brass, ~~and~~ solder, etc.

c. Insofar as possible, drainage piping shall not be installed within the ceiling or exposed in operating and delivery rooms, nurseries, food preparation centers, food--serving facilities, food storage areas, central services, electronic data processing areas, electric closets, and other sensitive areas. Where exposed~~,~~ overhead drain piping in these areas is unavoidable, special provisions shall be made to protect the space below from leakage, condensation, or dust particles.

d. Floor drains shall not be installed in operating and delivery rooms.

*e. If a floor drain is installed in cystoscopy, it shall contain a nonsplash, horizontal-flow flushing bowl beneath the drain plate.

~~f. Drain systems for autopsy tables shall be designed to positively avoid splatter or overflow onto floors or back siphonage and for easy cleaning and trap flushing.~~

~~g~~f. Building sewers shall discharge into community sewerage. Where such a system is not available, the facility shall treat its sewage in accordance with local and state regulations.

~~h~~g. Kitchen grease traps shall be located and arranged to permit easy access without the need to enter food preparation or storage areas. Grease traps shall be of capacity required and shall be accessible from outside ~~of~~ the building without need to interrupt any services.

~~i~~h. Where plaster traps are used, provisions shall be made for appropriate access and cleaning.

~~j~~i. In dietary areas, floor drains and/or floor sinks shall be of a type that can be easily cleaned by remov~~al~~ing ~~of~~the cover. ~~Provide f~~Floor drains or floor sinks shall be provided at all "wet" equipment (as ice machines) and as required for wet cleaning of floors. ~~Provide r~~Removable stainless steel mesh shall be provided in addition to grilled drain covers to prevent entry of large particles of waste ~~which~~ that might cause stoppages. Location of floor drains and floor sinks shall be coordinated to avoid conditions where locations of equipment make removal of covers for cleaning difficult.

9.31.E5. If piped medical gas is used, the installation, testing, and certification of nonflammable medical gas and air systems shall comply with the requirements of NFPA 99. Station outlets shall be provided consistent with need established by the functional program. (See Table 9.2.)

9.31.E6. Where the functional program requires, central clinical vacuum system installations shall be in accordance with NFPA 99.

9.31.E7. All piping, except control-line tubing, shall be identified. All valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.

9.31.E8. Where the functional program includes hemodialysis, continuously circulated filtered cold water shall be provided. Piping shall be in accordance with AAMI RD6.2.

9.31.E9. ~~Provide c~~Condensate drains for cooling coils shall be of a type that may be cleaned as needed without disassembly. (Unless specifically required by local authorities, traps are not required for condensate drains.) ~~Provide~~An air gap shall be provided where condensate drains empty into floor drains. ~~Provide h~~Heater elements shall be provided for condensate lines in freezers or other areas where freezing may be a problem.

9.31.E10. No plumbing lines ~~may~~ shall be exposed overhead or on walls where possible accumulation of dust or soil may create a cleaning problem or where leaks would create a potential for food contamination.

9.32 Electrical Standards

9.32.A. General

9.32.A1. All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99 and shall be listed as complying with available standards of listing agencies, or other similar established standards where such standards are required.

9.32.A2. The electrical installations, including alarm and communication systems, shall be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment shall show compliance with applicable codes and standards.

9.32.A3. Data processing and/or automated laboratory or diagnostic equipment, if provided, ~~such equipment~~ may require safeguards from power line disturbances.

9.32.B. Services and Switchboards

Main switchboards shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only. Switchboards shall be convenient for use, readily accessible for maintenance, away from traffic lanes, and located in dry, ventilated spaces free of corrosive or explosive fumes, gases, or any flammable material. Overload protective devices shall operate properly in ambient room temperatures.

9.32.C. Panelboards

Panelboards serving normal lighting and appliance circuits shall be located on the same floor as the circuits they serve. Panelboards serving critical branch emergency circuits shall be located on each floor that has major users. Panelboards serving Life Safety emergency circuits may also serve floors above and/or below.

9.32.D. Lighting

*__9.32.D1.__ Lighting shall be engineered to the specific application.

9.32.D2. The Illuminating Engineering Society of North America (IES) has developed recommended lighting levels for health care facilities. ~~The reader should r~~Refer to the latest edition of the *IES Handbook*.

9.32.D3. Approaches to buildings and parking lots, and all occupied spaces within buildings, shall have fixtures that can be illuminated as necessary.
~~Approaches to buildings and parking lots and all occupied spaces shall have fixtures for lighting that can be illuminated as necessary.~~

9.32.D4. ~~Consideration should be given to the~~As required by the functional program, special needs for the elderly shall be incorporated into the lighting design. Excessive contrast in lighting levels that makes

effective sight adaptation difficult should shall be minimized.

9.32.D5. A portable or fixed examination light shall be provided for examination, treatment, and trauma rooms.

9.32.D6. Operating and delivery rooms shall have general lighting in addition to special lighting units provided at surgical and obstetrical tables. General lighting and special lighting shall be on separate circuits.

9.32.D7. Operating rooms shall have general lighting in addition to special lighting units provided at surgical tables. General lighting and special lighting shall be on separate circuits.

9.32.D8. Light intensity of required emergency lighting shall generally comply with the IES recommendations. Egress and exit lighting shall comply with NFPA 101.

9.32.E. Receptacles (Convenience Outlets)

Duplex grounded-type receptacles (convenience outlets) shall be installed in all areas in sufficient quantities for tasks to be performed as needed. Each examination and work-table shall have access to a minimum of two duplex receptacles.

9.32.F. Equipment

9.32.F1. At inhalation anesthetizing locations, all electrical equipment and devices, receptacles, and wiring shall comply with applicable sections of NFPA 99 and NFPA 70.

9.32.F2. Fixed and mobile Xx-ray equipment installations shall conform to articles 517 and 660 of NFPA 70.

9.32.F3. Special equipment is identified in the following subsections of this chapter: Clinical Facilities, Radiology, and Laboratory. These sections shall be consulted to asensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

9.32.G. Nurse Call System
Reserved.

9.32.H. Emergency Electrical Service
Emergency lighting and power shall be provided for in accordance with NFPA 99, NFPA 101, and NFPA 110.

9.32.I. Fire Alarm System
Any fire alarm system shall be as required by NFPA 101 and installed per NFPA 72.

9.32.J. Telecommunications and Information Systems

9.32.J1. Locations for terminating telecommunications and information system devices shall be provided.

9.32.J2. A space shall be provided for central equipment locations. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

A9.1.F
Community outpatient units should ideally be conveniently accessible to patients via available public transportation.

A9.2.A. Multipurpose room(s) should be provided for private interviews, conferences, meetings, and health education purposes. Where health education is accommodated, the room(s) should be equipped for audiovisual aids.

A9.2.A2.c. Consideration should be given to special needs of or between specific patient groups in a shared/general waiting area, such as separation of adolescent and geriatric patients.

A9.2.B1. Door swings should be oriented to provide patient privacy.

A9.2.B2. Door swings should be oriented to provide patient privacy.

A9.2.B3. Door swings should be oriented to provide patient privacy.

A9.2.B4. This is to permit close observation of patients. An examination room may be modified to accommodate this function. A toilet room with lavatory should be immediately accessible.

A9.2.C7. Stretchers should have ready access to and from other areas of the facility. Particular attention should be paid to the management of outpatients for preparation, holding, and observation. The emergency, surgery, cystoscopy, and outpatient clinics should be accessible to the imaging suite. Imaging should be located with consideration of ceiling height requirements, proximity to electrical services, and future expansion considerations.

A9.3.F.
Examination rooms and services as described in Section 9.2.B may be provided. In addition, offices and/or practitioner consultation rooms may be combined with examination rooms.

A9.5. Outpatient Surgery Facility
The unrestricted area includes a central control point established to monitor the entrance of patients, personnel, and materials. Street clothes are permitted in this area, and traffic is not limited.

The semirestricted area includes the peripheral support areas of the surgical suite and has storage areas for clean and sterile supplies, work areas for storage and processing of instruments, and corridors leading to the restricted areas of the surgical suite. Traffic in this area is limited to authorized personnel and patients. Personnel are required to wear surgical attire and cover all head and facial hair.

The restricted area includes operating and procedure rooms, the clean core, and scrub sink areas. Surgical attire and hair coverings are required. Masks are required where open sterile supplies or scrubbed persons may be located.

A9.5.A Recovery Care Centers
Outpatient "surgical" facilities now incorporate centers that perform both invasive and noninvasive procedures. The distinction between centers can now be better defined by the type of anesthesia that is used during the procedure. Even though most outpatient procedures do not require an overnight stay, some require extended patient observation for up to "23 hours and 59 minutes" of care. This extended care possibility should address the need for adequate sleeping, bathroom, and nutrition services for the

patient. A key element to housing patients is the communication system and the ability to obtain additional assistance as necessary.

Recovery care centers should have adequate waiting areas for family including children and adolescents, and privacy (noise barriers and sight barriers) for meetings between physicians and other professionals with family. The areas should be large enough for translators or have available translation equipment.

A9.5.D1. Such roof overhang or canopy should extend as far as practicable to the face of the driveway or curb of the passenger access door of the transport vehicle. Vehicles in the loading area should not block or restrict movement of other vehicles in the drive or parking areas immediately adjacent to the facility.

A9.5.E2. This room is exclusively for the inspection, assembly, and packaging of medical/surgical supplies and equipment for sterilization. The area should contain work-tables or counters and storage facilities for backup supplies and instrumentation. An area for a drying cabinet or equipment may be required. The area should be spacious enough to hold sterilizer carts, if used, for loading or prepared supplies for sterilization.

A9.5.F. Clinical Facilities
Provisions should be made to separate pediatric from adult patients. ~~This~~ Separate areas should include pre- and post-operative care areas and should allow for parental presence.

A9.5.F2.a. American College of Surgeons Classes of Surgical Facilities

(1) Class A–Provides for minor surgical procedures performed under topical and local infiltration blocks with or without oral or intramuscular preoperative sedation. Excluded are spinal, epidural axillary, stellate ganglion blocks, regional blocks (such as interscalene), supraclavicular, infraclavicular, and intravenous regional anesthesia. These methods are appropriate for Class B and C facilities.

(2) Class B–Provides for minor or major surgical procedures performed in conjunction with oral, parenteral , or intravenous sedation or under analgesic or dissociative drugs.

(3) Class C–Provides for major surgical procedures that require general or regional block anesthesia and support of vital bodily functions.

Those facilities meeting the guidelines for Class B procedures automatically qualify for Class A procedures, and those facilities meeting the guidelines for Class C automatically qualify for Classes A and B.

A9.5.F2.e. For surgeries dependent upon medical imaging, such as many orthopedic procedures, medical image viewers should be provided in each operating room.

A9.5.F3.a. In the absence of a qualified functional program, recovery positions should be provided at a ratio of one per Class A operating room, two per Class B operating room, and three per Class C operating room. Up to one-half of the total recovery positions may be provided in the Phase 2 recovery area.

A9.7.
The birthing center was conceptualized as small (intimate), home-like service units serving a population of healthy childbearing families approaching pregnancy and birthing as a normal family event and seeking care in a safe environment outside of, but with access to, the acute-care hospital setting when needed. The freestanding birthing center may be a separate outpatient facility.

A9.8.A.
The range of services provided in these facilities is very dynamic and growing, including diagnostic cardiac catheterization, general radiography, fluoroscopy, mammography, CT scanning, magnetic resonance imaging (MRI), ultrasound, radiation therapy, and IV therapies. Facilities may specialize in only one of these areas or may provide a mix of services.

A9.9A. Visual and acoustical privacy should be provided by design and include the registration, preparation, examination, treatment, and recovery areas.

A9.9.F. [Proposal has asterisk, but no appendix text that I can find. Sent query to author 7/30.]

~~**A9.9.A1.** Wall outlets should be planned to minimize exposed power cords and cables. Monitors should be located for optimal visualization by practitioners.~~

A9.12.B22. All installed reverse osmosis water and dialysis solution piping should be accessible.

A9.30.C2.d When incinerators are used, consideration should be given to the recovery of waste heat from on-site incinerators used to dispose of large amounts of waste materials.

A9.30.C2.e Incinerators should be designed in a manner fully consistent with protection of public and environmental health, both on-site and off-site, and in compliance with federal, state, and local statutes and regulations. Toward this end, permit applications for incinerators and modifications thereof should be supported by ~~E~~environmental ~~A~~assessments and/or ~~E~~environmental ~~I~~impact ~~S~~statements (EISs) and/or ~~H~~health ~~R~~risk ~~A~~assessments (HRAs) as may be required by regulatory agencies. Except as noted below, such assessments should utilize standard U.S. EPA methods, specifically those set forth in U.S. EPA guidelines, and should be fully consistent with U.S. EPA guidelines for health risk assessment. Under some circumstances, however, regulatory agencies having jurisdiction over a particular project may require use of alternative methods.

A9.31.A1. Remodeling and work in existing facilities may present special problems. As practicality and funding permit, existing insulation, weather stripping, etc., should be brought up to standard for maximum economy and efficiency. Consideration should be given to additional work that may be needed to achieve this.

Insofar as practical, the facility should include provisions for recovery of waste cooling and heating energy (ventilation, exhaust, water and steam discharge, cooling towers, incinerators, etc.).

Facility design consideration shall include recognized energy-saving mechanisms such as variable air volume systems, load shedding, programmed controls for unoccupied periods (nights and weekends, etc.), and use of natural ventilation, site and climatic conditions permitting. Systems with excessive installation and/or maintenance costs that negate long-range savings should be avoided.

Use of mechanically circulated outside air does not reduce the need for filtration.

A9.31.A3. It may be practical in many areas to reduce or shut down mechanical ventilation during appropriate climatic and patient care conditions and to use open windows for ventilation.

A9.31.D6. See *Industrial Ventilation: A Manual of Recommended Practice*, published by the American Conference of Governmental Industrial Hygienists (www.acgih.org), for additional information.

A9.31.D9. One way to achieve basic humidification is with a steam jacketed manifold type humidifier, with a condensate separator that delivers high-quality steam. Additional booster humidification (if required) can be provided by steam jacketed humidifiers for each individually controlled area. Steam to be used for humidification may be generated in a separate steam generator. The steam generator feedwater may be supplied either from soft or reverse osmosis water. Provisions should be made for periodic cleaning.

A9.31.E3.c.
There are several ways to treat domestic water systems to kill *Legionella* and opportunistic water-borne pathogens. Complete removal of these organisms is not feasible, but methods to reduce the amount include hyperchlorination (free chlorine, chlorine dioxide, monochloramine), elevated hot water temperature, ozone injection, silver/copper ions, and ultraviolet light. Each of these options has advantages and disadvantages. While increasing the hot water supply temperature to 140°F (60°C) is typically considered the easiest option, the risk of scalding, especially to youth and the elderly, is significant. Additional consideration should be given to domestic water used in bone marrow transplant units. See CDC, ASHRAE, and ASPE documentation for additional information.

A9.31.E4.e. Floor drains in cystoscopy operating rooms have been shown to disseminate a heavily contaminated spray during flushing. Unless flushed regularly with large amounts of fluid, the trap tends to dry out and permit passage of gases, vapors, odors, insects, and vermin directly into the operating room. For new construction, if the users insist on a floor drain ~~is insisted upon by the users~~, the drain plate should be located away from the operative site, and should be over a frequently flushed nonsplash, horizontal-flow type of bowl, preferably with a closed system of drainage. Alternative methods include (a) an aspirator/trap installed in a wall connected to the collecting trough of the operating table by a closed, disposable tube system, or (b) a closed system using portable collecting vessels. (See NFPA 99.)

A9.32.D1. Light intensity of required emergency lighting should generally comply with the IES recommendations. Egress and exit lighting should comply with NFPA 101.

10. REHABILITATION FACILITIES

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

10.1 General Considerations

Rehabilitation facilities may be organized under hospitals (organized departments of rehabilitation), outpatient clinics, rehabilitation centers, and other facilities designed to serve either single- or multiple-disability categories, including but not limited to~~:~~ cerebrovascular, head trauma, spinal cord injury, amputees, complicated fractures, arthritis, neurological degeneration, genetic, and cardiac.

In general, rehabilitation facilities will have larger space requirements than general hospitals, have longer lengths of stay, and have less institutional and more residential environments.

10.1.A. Functional Units and Service Areas
Functional units and service areas shall include the following:

10.1.A1. Required patient units. Each rehabilitation facility shall contain a medical evaluation unit and one or more of the following units:

a. Psychological services unit.

b. Social services unit.

c. Vocational services.

10.1.A2. Required service areas. Each rehabilitation facility shall provide the following service areas, if appropriate to the functional program and ~~they are~~ not otherwise conveniently accessible to the facility ~~and appropriate to program functions~~:

a. Patient dining, recreation, and day spaces.

b. Dietary unit.

c. Personal care facilities.

d. Unit for teaching activities of daily living.

e. Administration department.

f. Engineering service and equipment areas.

g. Linen service.

h. Housekeeping rooms.

i. Employees' facilities.

j. Nursing unit.

10.1.A3. Optional units. The following special services areas, if required by the functional program, shall be provided as outlined in these sections. The sizes of the various ~~departments~~ units will depend upon the requirements of the ~~service to be provided~~functional program:

a. Sterilizing facilities.

b. Physical therapy unit.

c. Occupational therapy unit.

d. Prosthetics and orthotics unit.

e. Speech and hearing unit.

f. Dental unit.

g. Radiology unit.

h. Pharmacy unit.

i. Laboratory facilities.

j. Home health service.

k. Outpatient services.

l. Therapeutic pool.

m. Convenience store (i.e., expanded gift shop) with toiletries and other items ~~accessible~~ available to patients during extended ~~lengths of~~ stays.

10.2 Evaluation Unit

10.2.A. Office(s) for Personnel

10.2.B. Examination Room(s)
Examination rooms shall have a minimum floor area of 140 square feet (13.01 square meters), excluding such spaces as the vestibule, toilet, closet, and work counter (whether fixed or movable). The minimum room dimension shall be 10 feet (3.05 meters). The room shall contain a handwashing station, a work counter, ~~and~~ storage facilities, and a desk, counter, or shelf space for writing.

10.2.C. Evaluation Room(s)
Evaluation rooms ~~areas~~ shall be arranged to permit appropriate evaluation of patient needs and progress and to determine specific programs of rehabilitation. Rooms shall include a desk and work area for the evaluators; writing and work space for patients; and storage for supplies. Where the facility is small and workload light, evaluation ~~may be done~~ shall be permitted in ~~the~~ examination room(s).

10.2.D. Laboratory Facilities
Facilities shall be provided within the rehabilitation department or through contract arrangement with a

nearby hospital or laboratory service for hematology, clinical chemistry, urinalysis, cytology, pathology, and bacteriology. If these facilities are provided through contract, the following minimum laboratory services shall be provided in the rehabilitation facility:

10.2.D1. Laboratory work counter(s) with a sink~~,~~ and gas and electric service.

10.2.D2. Handwashing stations.

10.2.D3. Storage cabinet(s) or closet(s).

10.2.D4. Specimen collection facilities. Urine collection rooms shall be equipped with a water closet and ~~lavatory~~handwashing station. Blood collection facilities shall have space for a chair and work counter.

10.2.E. Imaging Facilities
The following special services areas, if required by the functional program, shall be provided as outlined in Section 7.10.E. The sizes of the various ~~departments~~ areas will depend upon the requirements of the service to be provided~~:~~.

10.2.E1. Electromyography~~ic~~.

10.2.E2. CAT scan.

10.2.E3. MRI.

10.2.E4. Nuclear medicine.

10.2.E5. Radiographic.

10.3 Psychological Services Unit

~~This shall include o~~Office(s) and work space shall be provided for testing, evaluation, and counseling.

10.4 Social Services Unit

~~This shall include o~~Office space(s) shall be provided for private interviewing and counseling.

10.5 Vocational Services Unit

Office(s) and work space shall be provided for vocational training, counseling, and placement~~ shall be provided~~.

10.6 Dining, Recreation, and Day Spaces

The following standards shall be met for patient dining, recreation, and day spaces (areas may be in separate or adjoining spaces):

10.6.A. Inpatient~~s~~ and Resident~~s~~ Spaces
A total of 55 square feet (5.11 square meters) per bed.

10.6.B. Outpatient~~s~~ Spaces
If dining is part of the day care program, a total of 55 square feet (5.11 square meters) per person shall be provided. If dining is not part of the program, at least 35 square feet (3.25 square meters) per person shall be provided for recreation and day spaces. A handwashing station shall be provided in each dining room.

10.6.C. Storage
Storage spaces shall be provided for recreational equipment and supplies.

10.7 Dietary Department

*__10.7.A. General__
Construction, equipment, and installation of food service facilities shall meet the requirements of the functional program. ~~Services may consist of an on-site conventional food preparation system, a convenience food service system, or an appropriate combination thereof. On-site facilities should be provided for emergency food preparation and refrigeration.~~

The following facilities shall be provided as required to implement the food service selected:

10.7.A1. A control station for receiving food supplies.

10.7.A2. Food preparation facilities. Conventional food preparation systems require space and equipment for preparing, cooking, and baking. Convenience food service systems such as frozen prepared meals, bulk packaged entrees, individually packaged portions, and contractual commissary services require space and equipment for thawing, portioning, cooking, and/or baking.

10.7.A3. Handwashing station(s) located in the food preparation area.

10.7.A4. Patients' meal service facilities for tray assembly and distribution.

10.7.A5. Separate dining space ~~shall be provided~~ for staff.

10.7.A6. Ware-washing space. This shall be located in a room or ~~an~~ alcove separate from the food preparation and serving area. Commercial dishwashing equipment shall be provided. Space shall also be provided for receiving, scraping, sorting, and stacking soiled tableware and for transferring clean tableware to the using areas. A ~~lavatory~~ handwashing station shall be conveniently available.

10.7.A7. Pot-washing facilities.

10.7.A8. Storage areas for cans, carts, and mobile tray conveyors.

10.7.A9. Waste storage facilities. These shall be located in a separate room easily accessible to the outside for direct waste pickup or disposal.

10.7.A10. Office(s) or desk spaces for dietitian(s) or the dietary service manager.

10.7.A11. Toilets for dietary staff. Handwashing stations shall be immediately available.

10.7.A12. Housekeeping room. This shall be located within the dietary department and shall contain a floor receptor or service sink and storage space for housekeeping equipment and supplies.

10.7.A13. Self-dispensing ice-making facilities. ~~This~~ These may be in an area or room separate from the food preparation area but ~~must~~ shall be easily cleanable and convenient to dietary facilities.

10.8 Personal Care Unit for Inpatients

A separate room with appropriate fixtures and utilities shall be provided for patient grooming. The activities for daily living unit may serve this purpose.

10.9 Activities for Daily Living Unit

A unit for teaching daily living activities shall be provided. It shall include a bedroom, bath, kitchen, and space for training stairs. Equipment shall be functional. The bathroom ~~must~~ shall be ~~an~~in addition to other toilet and bathing requirements. The facilities ~~should~~ shall be similar to a residential environment so that ~~the~~ patients ~~may~~ can learn to use ~~them~~ those at home.

10.10 Administration and Public Areas

10.10.A. Entrance
A grade-level entrance, sheltered from the weather and able to accommodate wheelchairs, shall be provided.

10.10.B. Lobby
The lobby shall include the following:

10.10.B1. Wheelchair storage space(s).

10.10.B2. A reception and information counter or desk.

10.10.B3. Waiting space(s).

10.10.B4. Public toilet facilities.

10.10.B5. Public telephone(s).

10.10.B6. Drinking fountain(s).

10.10.B7. Convenience store (as described in Section 10.1.A3.m).

10.10.C. Interview Space(s)
Space for private interviews relating to social service, credit, and admissions ~~shall be provided if not provided under Section 10.1.A1~~.

10.10.D. General or Individual Office(s)
General or individual offices for business transactions, records, and administrative and professional staffs ~~shall be provided if not provided under Section 10.1.A2~~.

10.10.E. Multipurpose Room(s)
Multipurpose room(s) for conferences, meetings, health education, and library services shall be provided.

10.10.F. Patient Storage

~~Due Because their to~~ Rehab patients' length of stay ~~being~~is longer than that of typical acute care patients.~~,~~ ~~rehab patients may require more s~~Space for storage of patients' personal effects shall meet the needs of the functional program.

10.10.G. General Storage
Separate space for office supplies, sterile supplies, pharmaceutical supplies, splints and other orthopedic supplies, and housekeeping supplies and equipment shall be provided.

10.11 Engineering Service and Equipment Areas

10.11.A. Equipment Rooms
Rooms for boilers, mechanical equipment, and electrical equipment shall be provided.

10.11.B. Storage Room(s)
Storage rooms for building maintenance supplies and yard equipment shall be provided.

10.11.C. Waste Processing Services

10.11.C1. Space and facilities shall be provided for the sanitary storage and disposal of waste.

10.11.C2. If provided, design and construction of incinerators and trash chutes shall be in accordance with NFPA 82 and ~~shall also conform to~~ the requirements prescribed by environmental regulations.

10.12 Linen Services

10.12.A. On-site Processing
If linen is to be processed on the site, the following shall be provided:

10.12.A1. Laundry processing room with commercial equipment that can process seven days' laundry within a regularly scheduled workweek. A ~~H~~handwashing station shall be provided.

10.12.A2. Soiled linen receiving, holding, and sorting room with handwashing station and cart-washing facilities.

10.12.A3. Storage for laundry supplies.

10.12.A4. Clean linen storage, issuing, and holding room or area.

10.12.A5. Housekeeping room, containing a floor receptor or service sink and storage space for housekeeping equipment and supplies.

10.12.B. Off-site Processing
If linen is processed off the rehabilitation facility site, the following shall be provided:

10.12.B1. Soiled linen holding room.

10.12.B2. Clean linen receiving, holding, inspection, and storage room(s).

10.13 Housekeeping Room(s)

In addition to the housekeeping rooms called for in certain departments, housekeeping rooms shall be provided throughout the facility as required to maintain a clean and sanitary environment. Each shall contain a floor receptor or service sink and storage space for housekeeping supplies and equipment.

10.14 Employee Facilities

In addition to the employee facilities such as locker rooms, lounges, toilets, or showers called for in certain departments, a sufficient number of such facilities to accommodate the needs of all personnel and volunteers shall be provided.

10.15 Nursing Unit (for Inpatients)

Where inpatients are a part of the facility, each nursing unit shall provide the following:

10.15.A. Patient Rooms

Each patient room shall meet the following requirements:

10.15.A1. Maximum room occupancy shall be four patients. Larger units ~~may be provided~~ shall be permitted if justified by the functional program. At least two single-bed rooms with private toilet rooms shall be provided for each nursing unit.

10.15.A2. Minimum room areas exclusive of toilet rooms, closets, lockers, wardrobes, alcoves, or vestibules shall be 140 square feet (13.01 square meters) in single-bed rooms and 125 square feet (11.61 square meters) per bed in multiple-bed rooms. In multiple-bed rooms, a clearance of 3 feet 8 inches (1.12 meters) shall be maintained at the foot of each bed to permit the passage of equipment and beds.

10.15.A3. Each patient sleeping room shall have a window in accordance with Sections ~~7.28.A11~~10.24.A7, 10.24.A8, and 10.24.A9.

10.15.A4. A nurses' calling system shall be provided.

10.15.A5. Handwashing stations shall be provided in each patient room.

10.15.A6. Each patient shall have access to a toilet room without having to enter the general corridor area. One toilet room shall serve no more than four beds and no more than two patient rooms. The toilet room shall contain a water closet and a handwashing station. The handwashing station may be omitted from a toilet room that serves single-bed and two-bed rooms if each such patient's room contains a handwashing station. Each toilet room shall be of sufficient size to ensure that wheelchair users will have access.

10.15.A7. Each patient shall have a wardrobe, closet, or locker with minimum clear dimensions of 1 foot 10 inches (558.8 millimeters) by 1 foot 8 inches (508 millimeters). An adjustable clothes rod and adjustable shelf shall be provided.

10.15.A8. Visual privacy shall be provided for each patient in multiple-bed rooms.

10.15.B. Service Areas

The service areas noted ~~below~~ in Sections 10.15.B1 through 10.15.B16 shall be in or readily available to each nursing unit. The size and disposition of each service area ~~will depend upon the number and types of~~

~~disabilities for which care will be provided~~shall meet the needs of the functional program. Although identifiable spaces are required for each indicated function, consideration ~~will~~ shall be given to alternative designs that accommodate some functions without designating specific areas or rooms. ~~Such proposals shall be submitted for prior approval.~~ Each service area may be arranged and located to serve more than one nursing unit, but at least one such service area shall be provided on each nursing floor. The following service areas shall be provided:

10.15.B1. Administrative center or nurses’ station.

10.15.B2. Nurses' office.

10.15.B3. Storage for administrative supplies.

10.15.B4. Handwashing stations located near the nurse station and the drug distribution station. One ~~lavatory~~ handwashing station may serve both areas.

10.15.B5. Charting facilities for nurses and doctors.

10.15.B6. Lounge and toilet room(s) for staff.

10.15.B7. Individual closets or compartments for safekeeping personal effects of nursing personnel, located convenient to the duty station or in a central location.

10.15.B8. Room for examination and treatment of patients. ~~This room may be omitted if all patient rooms are single bed rooms. It~~ This room shall have a minimum floor area of 120 square feet (11.15 square meters), excluding space for vestibules, toilet, closets, and work counters (whether fixed or movable). The minimum room dimension shall be 10 feet (3.05 meters). The room shall contain a handwashing station, work counter, storage facilities, and a desk, counter, or shelf space for writing. This room may be omitted if all patient rooms are single-bed rooms. The examination room in the evaluation unit may be used if it is conveniently located.

10.15.B9. Clean workroom or clean holding room.

10.15.B10. Soiled workroom *or* soiled holding room.

10.15.B11. Medication station. Provisions shall be made for convenient and prompt 24-hour distribution of medicine to patients. Distribution may be from a medicine preparation room, a self-contained medicine dispensing unit, or through another approved system. If used, a medicine preparation room shall be under the nursing staff's visual control and contain a work counter, refrigerator, and locked storage for biologicals and drugs. A medicine dispensing unit may be located at a nurse station, in the clean workroom, or in an alcove or other space under direct control of nursing or pharmacy staff.

10.15.B12. Clean linen storage. A separate closet or an area within the clean workroom shall be provided for this purpose. If a closed-cart system is used, storage may be in an alcove.

10.15.B13. Nourishment station. This shall be accessible to patients and contain a handwashing station, equipment for serving nourishment between scheduled meals, a refrigerator, storage cabinets, and ice maker-dispenser units to provide for patient service and treatment.

10.15.B14. Equipment storage room. This shall be for equipment such as I~~.~~V~~.~~ stands, inhalators, air

mattresses, and walkers.

10.15.B15. Parking for stretchers and wheelchairs. This shall be located out of the path of normal traffic.

10.15.B16. Multipurpose day room. Due to patients' length of stay, a day room shall be provided for patients to socialize on the unit.

10.15.C. Patient Bathing Facilities
Bathtubs or showers shall be provided at a ratio of one bathing facility for each eight beds not otherwise served by bathing facilities within patient rooms. Each tub or shower shall be in an individual room or privacy enclosure that provides space for the private use of bathing fixtures, for drying and dressing, and for a wheelchair and an assistant. Showers in central bathing facilities shall be at least 4 feet (1.22 meters) square, curb-free, and designed for use by a wheelchair patient.

10.15.D. Patient Toilet Facilities

10.15.D1. A toilet room that does not require travel through the general corridor shall be accessible to each central bathing area.

10.15.D2. Doors to toilet rooms shall have a minimum width of 2 feet 10 inches (863.6 millimeters) to admit a wheelchair. The doors shall permit access from the outside in case of an emergency.

10.15.D3. A handwashing station shall be provided for each water closet in each multi-fixture toilet room.

10.15.E. The need for and number of required airborne infection isolation rooms in the rehabilitation facility shall be determined by an infection control risk assessment. When required, the airborne infection isolation room(s) shall comply with the general requirements of Section 7.2.C. They~~se~~ may be located within individual nursing units and used for normal acute care when not required for isolation cases, or they may be grouped as a separate isolation unit.

10.16 Sterilizing Facilities

Where required by the functional program, a system for sterilizing equipment and supplies shall be provided.

10.17 Physical Therapy Unit

The following elements shall be provided.~~:~~ (Items 10.17.A, B, E, F, and G may be planned and arranged for shared use by occupational therapy patients and staff if the functional program reflects this sharing concept.)

10.17.A. Office Space

10.17.B. Waiting Space

10.17.C. Treatment Area(s)
For thermotherapy, diathermy, ultrasonics, hydrotherapy, etc., cubicle curtains shall be provided around each individual treatment area~~ shall be provided~~. Handwashing station(s) shall also be provided. One handwashing station may serve more than one cubicle. Facilities for collection of wet and soiled linen and other material shall be provided. As a minimum, one individual treatment area shall be enclosed within

walls and have a door for access—minimum size 80 square feet (7.44 square meters). Curtained treatment areas shall have a minimum size of 70 square feet (6.51 square meters).

10.17.D. ~~An~~ Exercise Area
Space requirements shall be designed to permit access to all equipment and be sized to accommodate equipment for physical therapy.

10.17.E. Storage for Clean Linen, Supplies, and Equipment

10.17.F. Patients' Dressing Areas, Showers, Lockers, and Toilet Rooms
~~Patients' dressing areas, showers, lockers, and toilet rooms~~ These shall be provided as required by the functional program.

10.17.G. Wheelchair and Stretcher Storage
~~(Items 10.17.A, B, E, F, and G may be planned and arranged for shared use by occupational therapy patients and staff if the functional program reflects this sharing concept.)~~

10.18 Occupational Therapy Unit

The following elements shall be provided. (Items 10.18.A, B, D, and E may be planned and arranged for shared use by physical therapy patients and staff if the functional program reflects this sharing concept.)~~:~~

10.18.A. Office Space

10.18.B. Waiting Space

10.18.C. Activity Areas
~~Provisions shall be made for a sink or lavatory and for the collection of waste products prior to disposal.~~

10.18.D. Storage for Supplies and Equipment

10.18.E. Patients' Dressing Areas, Showers, Lockers, and Toilet Rooms
~~Patients' dressing areas, showers, lockers, and toilet rooms~~ These shall be provided as required by the functional program.

~~(Items 10.18.A, B, D, and E may be planned and arranged for shared use by physical therapy patients and staff if the functional program reflects this sharing concept.)~~

10.19 Prosthetics and Orthotics Unit

The following elements shall be provided:

10.19.A. Workspace for Technician(s)

10.19.B. Space for Evaluation and Fitting
This shall include provision for privacy.

10.19.C. Space for Equipment, Supplies, and Storage

10.20 Speech and Hearing Unit

This shall include the following:

10.20.A. Office(s) for Therapists

10.20.B. Space for Evaluation and Treatment

10.20.C. Space for Equipment and Storage

10.21 Dental Unit

The following elements shall be provided if required by the functional program:

10.21.A. Operatory
This shall contain a handwashing station.

10.21.B. Laboratory and Film Processing Facilities

10.22 Imaging Suite

This unit shall contain ~~the following elements:~~

~~**10.22.A. I**~~imaging room(s) ~~shall be provided~~ as required by the functional program. (See Section 7.10 for special requirements.)

10.23 Pharmacy Unit

The size and type of services to be provided in the pharmacy will depend ~~up~~on the drug distribution system chosen and whether the facility proposes to provide, purchase, or share pharmacy services. ~~This shall be explained in the functional program.~~ If a pharmacy is required by the functional program, provisions shall be made for the following functional areas:

10.23.A. A Dispensing Area with a Handwashing Station

10.23.B. An Editing or Order Review Area

10.23.C. An Area for Compounding

10.23.D. Administrative Areas

10.23.E. Storage Areas

10.23.F. A Drug Information Area

10.23.G. A Packaging Area

10.23.H. A Quality-Control Area

10.24 Details and Finishes

Patients in a rehabilitation facility will be disabled to differing degrees. Therefore, high standards of safety for the occupants shall be provided to minimize accidents. All details and finishes for renovation projects as well as for new construction shall comply with the following requirements insofar as they affect patient services:

10.24.A. Details

10.24.A1. Compartmentation, exits, automatic extinguishing systems, and other details relating to fire prevention and fire protection in inpatient rehabilitation facilities shall comply with requirements listed in NFPA 101. In freestanding outpatient rehabilitation facilities, details relating to exits and fire safety shall comply with the appropriate occupancy chapter of NFPA 101 and the requirements outlined herein.

10.24.A2. Items such as drinking fountains, telephone booths, vending machines, and portable equipment shall not restrict corridor traffic or reduce the corridor width below the required minimum.

10.24.A3. Rooms containing bathtubs, sitz baths, showers, and water closets subject to patient use shall be equipped with doors and hardware that will permit access from the outside in an emergency. When such rooms have only one opening or are small, the doors shall open outward or be otherwise designed to open without pressing against a patient who may have collapsed within the room.

10.24.A4. Minimum width of all doors to rooms needing access for beds shall be 3 feet 8 inches (1.12 meters). Doors to rooms requiring access for stretchers and doors to patient toilet rooms and other rooms needing access for wheelchairs shall have a minimum width of 2 feet 10 inches (.86 meter). Where the functional program states that the sleeping facility will be for residential use (and therefore not subject to in-bed patient transport), patient room doors may be 3 feet (0.91 meter) wide, if approved by the local authority having jurisdiction.

10.24.A5. Doors between corridors and rooms or those leading into spaces subject to occupancy, except elevator doors, shall be swing-type. Openings to showers, baths, patient toilets, and other small, wet-type areas not subject to fire hazard are exempt from this requirement.

10.24.A6. Doors, except those to spaces such as small closets not subject to occupancy, shall not swing into corridors in a manner that obstructs traffic flow or reduces the required corridor width.

10.24.A7. Windows shall be designed to prevent accidental falls when open, or shall be provided with security screens where deemed necessary by the functional program.

10.24.A8. Windows and outer doors that may be frequently left open shall be provided with insect screens.

10.24.A9. ~~Patient rooms intended for 24-hour occupancy shall have windows that operate without the use of tools and shall have sills not more than 3 feet (0.91 meter) above the floor.~~Operable windows are not required in patient rooms.

10.24.A10. Doors, sidelights, borrowed lights, and windows glazed to within 18 inches (457.2 millimeters) of the floor shall be constructed of safety glass, wired glass, or plastic glazing material that resists breaking or creates no dangerous cutting edges when broken. Similar materials shall be used in wall openings of playrooms and exercise rooms. Safety glass or plastic glazing material shall be used for shower doors and

bath enclosures.

10.24.A11. Linen and refuse chutes shall comply with NFPA 101.

10.24.A12. Thresholds and expansion joint covers shall be flush with the floor surface to facilitate use of wheelchairs and carts in new facilities.

10.24.A13. Grab bars shall be provided at all patient toilets, bathtubs, showers, and sitz baths. The bars shall have 1-1/2 inches (38.1 millimeters) clearance to walls and shall be sufficiently anchored to sustain a concentrated load of 250 pounds (113.4 kilograms). Special consideration shall be given to shower curtain rods ~~which~~ that may be momentarily used for support.

10.24.A14. Recessed soap dishes shall be provided in showers and bathrooms.

10.24.A15. Handrails shall be provided on both sides of corridors used by patients. A clear distance of 1-1/2 inches (38.1 millimeters) shall be provided between the handrail and the wall, and the top of the rail shall be about 32 inches (812.8 millimeters) above the floor, except for special care areas such as those serving children.

10.24.A16. Ends of handrails and grab bars shall be constructed to prevent snagging the clothes of patients.

10.24.A17. Handwashing stations. Location and arrangement of handwashing stations shall permit proper use and operation and meet the following:~~.~~

a. Particular care ~~should~~ shall be given to clearance required for blade-type operating handles.

b. Lavatories intended for use by disabled patients shall be installed ~~to permit wheelchairs to slide under them~~in accordance with Section 1-4, Design Standards for the Disabled.

c. Provisions for hand drying shall be included at all handwashing stations.

d. Lavatories and handwashing stations shall be securely anchored to withstand an applied vertical load of not less than 250 pounds (113.4 kilograms) on the front of the fixture.

10.24.A18. Mirrors shall be arranged for convenient use by wheelchair patients as well as by patients in a standing position.

~~**10.24.A19.** Provisions for hand drying shall be included at all handwashing stations.~~

~~**10.24.A20.** Lavatories and handwashing stations shall be securely anchored to withstand an applied vertical load of not less than 250 pounds (113.4 kilograms) on the front of the fixture.~~

10.24.A19~~21~~. Radiation protection requirements of ~~X~~x-ray and gamma ray installations shall conform to ~~necessary~~ state and local laws. Provisions shall be made for testing the completed installation before use. All defects ~~must~~ shall be corrected before acceptance.

10.24.A20~~22~~. The minimum ceiling height shall be 7 feet 10 inches (2.39 meters), with the following exceptions:

a. Boiler rooms shall have a ceiling clearance not less than 2 feet 6 inches (762 millimeters) above the main boiler header and connecting piping.

b. Ceilings of radiographic and other rooms containing ceiling-mounted equipment, including those with ceiling-mounted surgical light fixtures, shall have sufficient height to accommodate the equipment and/or fixtures.

c. Ceilings in corridors, storage rooms, toilet rooms, and other minor rooms ~~may~~ shall be not less than 7 feet 8 inches (2.34 meters).

d. Suspended tracks, rails, and pipes located in the path of normal traffic shall be not less than 6 feet 8 inches (2.03 meters) above the floor.

~~**10.24.A23.** Recreation rooms, exercise rooms, and similar spaces where impact noises may be generated shall not be located directly over patient bed areas unless special provisions are made to minimize such noise.~~

10.24.A21~~24~~. Rooms containing heat-producing equipment (such as boiler or heater rooms and laundries) shall be insulated and ventilated to prevent any floor surface above from exceeding a temperature 10°F (6°C) above the ambient room temperature.

10.24.A22~~25~~. Noise reduction criteria shown in Table 7.1 shall apply to partition, floor, and ceiling construction in patient areas. Recreation rooms, exercise rooms, and similar spaces where impact noises may be generated shall not be located directly over patient bed areas unless special provisions are made to minimize such noise.

10.24.B. Finishes

10.24.B1. Cubicle curtains and draperies shall be noncombustible or rendered flame retardant and shall pass both the large- and small-~~-~~scale tests in NFPA 701.

10.24.B2. Floor materials shall be readily cleanable and appropriately wear-resistant for the location. Floor surfaces in patient areas shall be smooth and without irregular surfaces to prevent tripping by patients using orthotic devices. Floors in food preparation or assembly areas shall be water-resistant. Joints in tile and similar material in such areas shall also be resistant to food acids. In all areas frequently subject to wet cleaning methods, floor materials shall not be physically affected by germicidal and cleaning solutions. Floors subject to traffic while wet, such as shower and bath areas, kitchens, and similar work areas, shall have a nonslip surface.

10.24.B3. Wall bases in kitchens, soiled workrooms, and other areas that are frequently subject to wet cleaning methods shall be monolithic and coved with the floor, tightly sealed within the wall, and constructed without voids that can harbor insects.

10.24.B4. Wall finishes shall be washable and, in the proximity of plumbing fixtures, shall be smooth and moisture-resistant. Finish, trim, and floor and wall construction in dietary and food preparation areas shall be free from spaces that can harbor pests.

10.24.B5. Floor and wall areas penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of pests. Joints of structural elements shall be similarly sealed.

10.24.B6. Ceilings throughout shall be readily cleanable. All overhead piping and ductwork in the dietary and food preparation area shall be concealed behind a finished ceiling. Finished ceilings may be omitted in mechanical and equipment spaces, shops, general storage areas, and similar spaces, unless required for fire-resistive purposes.

10.24.B7. Acoustical ceilings shall be provided for corridors in patient areas, nurse stations, day rooms, recreational rooms, dining areas, and waiting areas.

10.25 Design and Construction, Including Fire-Resistant Standards

10.25.A. Design

Except as noted below, construction of freestanding outpatient rehabilitation facilities shall adhere to recognized national model building codes and/or to NFPA 101 and the minimum requirements contained herein. Rehabilitation facilities that accommodate inpatients shall comply with the construction requirements for general hospitals ~~as indicated~~ in ~~Section~~ Chapter 7.

10.25.B. Interior Finishes

Interior finish materials for inpatient facilities shall comply with the flame-spread limitations and the smoke-production limitations ~~set forth~~ in NFPA 101.

10.25.C. Insulation Materials

Building insulation materials, unless sealed on all sides and edges, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 150 or less when tested in accordance with NFPA 255~~-1984~~.

10.25.D. Provisions for Natural Disasters

For design and construction standards relating to hurricanes, tornadoes, and floods, see Section 7.29.F.

10.26-10.29 Reserved

10.30 Special Systems

10.30.A. General

10.30.A1. Prior to acceptance of the facility, all special systems shall be tested and operated to demonstrate to the owner or his designated representative that the installation and performance of these systems conform to design intent. Test results shall be documented for maintenance files.

10.30.A2. Upon completion of the special systems equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions, ~~a~~ parts lists, and complete procurement information, including equipment numbers and descriptions. Operating staff persons shall also be provided with instructions for proper operation of systems and equipment. Required information shall include all safety or code ratings as needed.

10.30.A3. Insulation shall be provided surrounding special system equipment to conserve energy, protect personnel, and reduce noise.

10.30.B. Elevators

10.30.B1. All buildings having patient facilities (such as bedrooms, dining rooms, or recreation areas) or critical services (such as diagnostic or therapy) located on other than the main entrance floor shall have

electric or hydraulic elevators. Installation and testing of elevators shall comply with ANSI/ASME A17.1, ANSI/ASME A17.3, or UFAS.

a. The number of elevators required shall be determined from a study of the facility plan and of the estimated vertical transportation requirements.

b. Hospital-type elevator cars shall have inside dimensions that accommodate a patient bed with attendants. Cars shall be at least 5 feet 8 inches (1.73 meters) wide by 9 feet (2.74 meters) deep. Car doors shall have a clear opening of not less than 4 feet (1.22 meters) wide and 7 feet (2.13 meters) high. In renovations, existing elevators that can accommodate patient beds used in the facility will not be required to be increased in size.

c. Elevator call buttons and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors. This is so that the light control feature will be overridden or disengaged should it encounter smoke at any landing.

10.30.B2. Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this section as well as all applicable safety regulations and codes.

10.30.C. Waste Processing Services

~~**10.30.C1.** Storage and disposal. Facilities shall be provided for sanitary storage and treatment or disposal of waste using techniques acceptable to the appropriate health and environmental authorities. The functional program shall stipulate the categories and volumes of waste for disposal and shall stipulate the methods of disposal for each.~~

~~**10.30.C2.** Medical waste. Medical waste shall be disposed of either by incineration or other approved technologies. Incinerators or other major disposal equipment may be shared by two or more institutions.~~
***10.30.C1.** Collection and storage. Waste collection and storage locations shall be determined by the facility as a component of the functional program. The functional program shall stipulate the categories and volumes of waste for disposal and the methods of handling and disposal of waste. The functional program shall outline the space requirements, including centralized waste collection and storage spaces. Size of spaces shall be determined based upon volume of projected waste and length of anticipated storage.

a. At docks or other waste removal areas, the functional program shall stipulate the location of compactors, balers, sharps, and recycling container staging. Red bag waste shall be staged in enclosed and secured areas. Biohazardous and environmentally hazardous materials, including mercury, nuclear reagent waste, and other regulated waste types, shall be segregated and secured.

b. If provided, regulated medical waste or infectious waste storage spaces shall have a floor drain, cleanable floor and wall surfaces, lighting, and exhaust ventilation, and should be safe from weather, animals and unauthorized entry. Refrigeration requirements for such storage facilities shall comply with state and/or local regulations.

10.30.C2 Waste treatment and disposal technologies.

*a. On-site hospital incinerators shall comply with federal, state, and local regulatory and environmental

requirements. The design and construction of incinerators and trash chutes shall comply with NFPA 82.

*b. Types of non-incineration waste treatment technology(ies) shall be determined by the facility in conjunction with environmental, economic, and regulatory considerations. The functional program shall describe waste treatment technology components.

(1) In determining the location for a non-incineration technology, safe transfer routes, distances from waste sources, temporary storage requirements, as well as space requirements for treatment equipment shall be considered. The location of the technology shall not cause traffic problems as waste is brought in and out. Odor, noise, and the visual impact of medical waste operations on patients, visitors, public access and security shall be considered.

(2) Space requirements for such technologies shall be determined by the equipment requirements, including associated area for opening waste entry doors, access to control panels, space for hydraulic lifts, conveyors, and operational clearances. Mobile or portable units, trailer-mounted units, underground installations, or all-weather enclosed shelters at an outdoor site may also be used, subject to local regulatory approvals.

(3) Exhaust vents, if any, from the treatment technology shall be located a minimum of 75 feet (22.86 meters) from inlets to HVAC systems. If the technology involves heat dissipation, sufficient cooling and ventilation shall be provided.

10.31 Mechanical Standards

10.31.A. General

10.31.A1. The mechanical system ~~should~~ shall be designed for overall efficiency and life cycle costing. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually. Recognized engineering procedures shall be followed for the most economical and effective results. A well-designed system can generally achieve energy efficiency at minimal additional cost and simultaneously provide improved patient comfort. Different geographic areas may have climatic and use conditions that favor one system over another in terms of overall cost and efficiency. In no case shall patient care or safety be sacrificed for conservation.

~~Mechanical, electrical, and HVAC equipment may be located either internally, externally, or in separate buildings.~~

10.31.A2. Remodeling and work in existing facilities may present special problems. As practicality and funding permit, existing insulation, weather stripping, etc., ~~should~~ shall be brought up to standard for maximum economy and efficiency. Consideration shall be given to additional work that may be needed to achieve this.

10.31.A3. Facility design consideration shall include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.

10.31.A4. Insofar as practical, the facility ~~should~~ shall include provisions for recovery of waste cooling and heating energy (ventilation, exhaust, water and steam discharge, cooling towers, incinerators, etc.).

***10.31.A5.** Facility design consideration shall include recognized energy-saving mechanisms such as variable air volume (VAV) systems, load shedding, programmed controls for unoccupied periods (nights

and weekends, etc.), and use of natural ventilation, site and climatic conditions permitting. ~~Systems with excessive installation and/or maintenance costs that negate long-range energy savings should be avoided.~~

10.31.A6. Air-handling systems shall be designed with an economizer cycle where appropriate to use outside air. (Use of mechanically circulated outside air does not reduce need for filtration.)

It may be practical in many areas to reduce or shut down mechanical ventilation ~~during~~ under appropriate climatic and patient care conditions and to use open windows for ventilation.

10.31.A8. Mechanical equipment, ductwork, and piping shall be mounted on vibration isolators as required to prevent unacceptable structure-borne vibration.

10.31.A9. Supply and return mains and risers for cooling, heating, and steam systems shall be equipped with valves to isolate the various sections of each system. Each piece of equipment shall have valves at the supply and return ends.

10.31.B. Thermal and Acoustical Insulation

10.31.B1. Insulation shall be provided within the building ~~shall be provided~~ to conserve energy, protect personnel, prevent vapor condensation, and reduce noise.

10.31.B2. Insulation on cold surfaces shall include an exterior vapor barrier. (Material that will not absorb or transmit moisture will not require a separate vapor barrier.)

10.31.B3. Insulation, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less as determined by an independent testing laboratory in accordance with NFPA 255.

10.31.B4. If duct lining is used, it shall be coated and sealed, and shall meet ASTM C1071. These linings (including coatings, adhesives, and exterior surface insulation on pipes and ducts in spaces used as air supply plenums) shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as determined by an independent testing laboratory in accordance with NFPA 255. If existing lined ductwork is reworked in a renovation project, the liner seams and punctures shall be resealed.

10.31.B5. Existing accessible insulation within areas of facilities to be modernized shall be inspected, repaired, and/or replaced, as appropriate.

10.31.B6. Duct lining shall not be installed within 15 feet (4.57 meters) downstream of humidifiers.

10.31.C. Steam and Hot Water Systems

10.31.C1. Boilers shall have the capacity, based upon the net ratings published by the Hydronics Institute or another acceptable national standard, to supply the normal heating, hot water, and steam requirements of all systems and equipment. Their number and arrangement shall accommodate facility needs despite the breakdown or routine maintenance of any one boiler. The capacity of the remaining boiler(s) shall be sufficient to provide hot water service for clinical, dietary, and patient use; steam for sterilization and dietary purposes; and heating for operating, recovery, and general patient rooms. However, reserve capacity for facility space heating is not required in geographic areas where a design dry-bulb temperature of 25°F (-4°C) or more represents not less than 99 percent of the total hours in any one heating month as noted in ASHRAE's *Handbook of Fundamentals*, under the "Table for Climatic Conditions for the

United States."

10.31.C2. Boiler accessories, including feed pumps, heat-circulating pumps, condensate return pumps, fuel oil pumps, and waste heat boilers, shall be connected and installed to provide both normal and standby service.

10.31.D. Heating, Ventilation, and Air Conditioning~~,~~ (HVAC) ~~Heating, and Ventilation~~ Systems

10.31.D1. All rooms and areas in the facility used for patient care shall have provisions for ventilation. The ventilation rates shown in Table 7.2 shall be used only as minimum standards; they do not preclude the use of higher, more appropriate rates. ~~T~~Although natural window ventilation for nonsensitive areas and patient rooms ~~may be employed~~is permitted, ~~weather permitting, availability of~~ mechanical ventilation ~~should~~ shall be considered for use in interior areas and during periods of temperature extremes. Fans serving exhaust systems shall be located at the discharge end and shall be readily serviceable. Air supply and exhaust in rooms for which no minimum total air change rate is noted may vary down to zero in response to room load. For rooms listed in Table 7.2, where VAV systems are used, minimum total air change shall be within limits noted. ~~Temperature control shall also comply with these standards.~~ Space temperature and relative humidity shall be as indicated in Table 7.2. To maintain asepsis control, airflow supply and exhaust ~~should~~ shall generally be controlled to ensure movement of air from "clean" to "less clean" areas, especially in critical areas. The ventilation systems shall be designed and balanced according to the requirements shown in Table 7.2 and in the applicable notes.

For renovation projects, prior to the start of construction, and preferrably during the design, airflow and static pressure measurements shall be taken at the connection points of new ductwork to existing systems. This information shall be used by the designer to determine if existing systems have sufficient capacity for the intended new purposes, and for any required modifications to the existing system to be included in the design documentation.

10.31.D2. General exhaust systems may be combined to enhance the efficiency of recovery devices required for energy conservation. Local exhaust systems shall be used whenever possible in place of dilution ventilation to reduce exposure to hazardous gases, vapors, fumes, or mists.

Exhaust outlets from areas that may be contaminated shall be above roof level, arranged to minimize recirculation of exhaust air into the building, and directed away from personnel service areas.

10.31.D3. Fresh air intakes shall be located at least 25 feet (7.62 meters) from exhaust outlets of ventilating systems, combustion equipment stacks, medical-surgical vacuum systems, plumbing vents, or areas that may collect vehicular exhaust or other noxious fumes. (Prevailing winds and/or proximity to other structures may require greater clearances. **[Clemson: appendix?]**) Plumbing and vacuum vents that terminate at a level above the top of the air intake may be located as close as 10 feet (3.05 meters). The bottom of outdoor air intakes serving central systems shall be as high as practical, but at least 6 feet (1.83 meters) above ground level, or, if installed above the roof, 3 feet (0.91 meter) above roof level. ~~Exhaust outlets from areas that may be contaminated shall be above roof level, arranged to minimize recirculation of exhaust air into the building, and directed away from personnel service areas.~~

10.31.D4. All central ventilation or air conditioning systems shall be equipped with filters with efficiencies equal to, or greater than, those specified in Table 7.3. Where two filter beds are required, filter bed no. 1 shall be located upstream of the air conditioning equipment and filter bed no. 2 shall be downstream of any fan or blowers. Filter efficiencies, tested in accordance with ASHRAE 52.1-92, shall be average. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing duct~~-~~work. All joints

between filter segments and enclosing duct~~-~~work shall have gaskets or seals to provide a positive seal against air leakage. A manometer shall be installed across each filter bed having a required efficiency of 75 percent or more, including hoods requiring HEPA filters. Provisions shall be made to allow access for field testing.

***10.31.D5.** If duct humidifiers are located upstream of the final filters, they shall be ~~located~~ at least 15 feet (4.57 meters) upstream of the final filters. Ductwork with duct-mounted humidifiers shall have a means of water removal. An adjustable high-limit humidistat shall be located downstream of the humidifier to reduce the potential ~~of~~ for condensation in the duct. All duct takeoffs ~~should~~ shall be sufficiently downstream of the humidifier to ensure complete moisture absorption. Steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.

10.31.D6. Air-handling duct systems shall be designed with accessibility for duct cleaning~~,~~ and shall meet the requirements of NFPA 90A.

10.31.D7. Ducts that penetrate construction intended for ~~X~~x-ray or other ray protection shall not impair the effectiveness of the protection.

10.31.D8. Fire and smoke dampers shall be constructed, located, and installed in accordance with the requirements of NFPA 101, 90A, and the specific damper's ~~L~~listing requirements. Fans, dampers, and detectors shall be interconnected so that damper activation will not damage ducts. Maintenance access shall be provided at all dampers. All damper locations ~~should~~ shall be shown on design drawings. Dampers ~~should~~ shall be activated ~~by fire or smoke sensors, not by fan cutoff alone~~in accordance with NFPA 90A. Switching systems for restarting fans may be installed for fire department use in venting smoke after a fire has been controlled. However, provisions should be made to avoid possible damage to the system due to closed dampers. When smoke partitions are required, heating, ventilation, and air conditioning zones shall be coordinated with compartmentation insofar as practical to minimize need to penetrate fire and smoke partitions.

10.31.D9. Hoods and safety cabinets may be used for normal exhaust of a space providing minimum air change rates are maintained. If air change standards in Table 7.2 do not provide sufficient air for proper operation of exhaust hoods and safety cabinets (when in use), makeup air (filtered and preheated) ~~should~~ shall be provided around these units to maintain the required airflow direction and exhaust velocity. Use of makeup air will avoid dependence upon infiltration from outdoors and/or from contaminated areas. Makeup systems for hoods shall be arranged to minimize "short circuiting" of air and to avoid reduction in air velocity at the point of contaminant capture.

10.31.D10. Laboratory fume hoods shall meet the following general standards:

a. Have an average face~~-~~ velocity of at least 75 feet per minute (0.38 meters per second).

b. Be connected to an exhaust system to the outside ~~which~~ that is separate from the building exhaust system.

c. Have an exhaust fan located at the discharge end of the system.

d. Have an exhaust duct system of noncombustible corrosion-resistant material as needed to meet the planned ~~usage~~ use of the hood.

10.31.D11. Laboratory hoods shall meet the following special standards:

a. Fume hoods~~,~~ and their associated equipment in the air stream~~,~~ intended for use with perchloric acid and other strong oxidants~~,~~ shall be constructed of stainless steel or other material consistent with special exposures, and shall be provided with a water wash and drain system to permit periodic flushing of duct and hood. Electrical equipment intended for installation within such ducts shall be designed and constructed to resist penetration by water. Lubricants and seals shall not contain organic materials. When perchloric acid or other strong oxidants are only transferred from one container to another, standard laboratory fume hoods and the associated equipment may be used in lieu of stainless steel construction.

b. In new construction and major renovation work, each hood used to process infectious or radioactive materials shall have a minimum face velocity of 90 to 110 feet per minute (0.46 to 0.56 meter per second) with suitable pressure-independent air modulating devices and alarms to alert staff of fan shutdown or loss of airflow. Each shall also have filters with a 99.97 percent efficiency ~~[~~(based on the ~~dioctyl phthalate~~ ~~(~~DOP~~)~~ test method~~]~~) in the exhaust stream, and shall be designed and equipped to permit the safe removal, disposal, and replacement of contaminated filters. Filters shall be as close to the hood as practical to minimize duct contamination. Fume hoods intended for use with radioactive isotopes shall be constructed of stainless steel or other material suitable for the particular exposure and shall comply with NFPA 801, *Facilities for Handling Radioactive Materials*. **Note**: Radioactive isotopes used for injections, etc., without probability of airborne particulates or gases may be processed in a clean-workbench-type hood where acceptable to the Nuclear Regulatory Commission.

10.31.D12. Exhaust hoods handling grease-laden vapors in food preparation centers shall comply with NFPA 96. All hoods over cooking ranges shall be equipped with grease filters, fire extinguishing systems, and heat-actuated fan controls. Cleanout openings shall be provided every 20 feet (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. ~~(~~Horizontal runs of ducts serving range hoods ~~should~~ shall be kept to a minimum.~~)~~

10.31.D13. The ventilation system for the space that houses ~~ethylene oxide (~~ETO~~)~~ sterilizers ~~should~~ shall be designed to:

a. Provide a dedicated (not connected to a return air or other exhaust system) exhaust system. Refer to 29 CFR Part 1910.1047.

b. All source areas shall be exhausted, including the sterilizer equipment room, service/aeration areas, over the sterilizer door, and the aerator. If the ETO cylinders are not located in a well-ventilated, unoccupied equipment space, an exhaust hood shall be provided over the cylinders. The relief valve shall be terminated in a well-ventilated, unoccupied equipment space, or outside the building. If the floor drain which the sterilizer(s) discharges to is not located in a well-ventilated, unoccupied equipment space, an exhaust drain cap shall be provided (coordinate with local codes).

c. Ensure that general airflow is away from sterilizer operator(s).

d. ~~Provide a~~A dedicated exhaust duct system for ETO shall be provided. The exhaust outlet to the atmosphere ~~should~~shall be at least 25 feet (7.62 meters) away from any air intake.

e. An audible and ~~visual~~ visible alarm shall activate in the sterilizer work area~~,~~ and in a 24-hour staffed location~~,~~ upon loss of airflow in the exhaust system.

10.31.D14. Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit work station temperatures.

10.31.D15. Gravity exhaust may be used, where conditions permit, for nonpatient areas such as boiler rooms, central storage, etc.

10.31.D16. The energy-saving potential of variable air volume systems is recognized, and the~~se~~ standards ~~herein~~ in this document are intended to maximize appropriate use of ~~that~~ such systems. Any system ~~utilized~~ used for occupied areas shall include provisions to avoid air stagnation in interior spaces where thermostat demands are met by temperatures of surrounding areas.

10.31.D17. Rooms used for sputum induction, aerosolized pentamidine treatments, or other cough-inducing procedures shall meet the requirements of Table 7.2 for airborne infection isolation rooms. If booths are used, refer to Section 7.15.

10.31.D18. Non~~-~~central air-~~-~~handling systems~~,~~ (i.e., individual room units that are used for heating and cooling purposes) (fan-coil units, heat pump units, etc.) shall be equipped with permanent (cleanable) or replaceable filters. The filters shall have a minimum efficiency of 68 percent weight arrestance (MERV 3). These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air handling system with the proper filtration, as noted in Table 7.3.

10.31.E. Plumbing and Other Piping Systems~~.~~

Unless otherwise specified herein, all plumbing systems shall be designed and installed in accordance with *National Standard Plumbing Code*, chapter 14, Medical Care Facility Plumbing Equipment.

10.31.E1. The following standards shall apply to plumbing fixtures:

a. The material used for plumbing fixtures shall be nonabsorptive and acid-resistant.

b. Water spouts used in lavatories and sinks shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc.

c. General handwashing stations used by medical and nursing staff and all handwashing stations used by patients and food handlers shall be trimmed with valves that can be operated without hands. (Single lever or wrist blade devices may be used.) Blade handles used for this purpose shall not exceed 4-1/2 inches (114.3 millimeters) in length. Handles on clinical sinks shall be at least 6 inches (152.4 millimeters) long. Freestanding scrub sinks and handwashing stations used for scrubbing in procedure rooms shall be trimmed with foot, knee, or ultrasonic controls (no single lever wrist blades).

d. Clinical sinks shall have an integral trap wherein the upper portion of the water trap provides a visible seal.

e. Showers and tubs shall have nonslip walking surfaces.

10.31.E2. The following standards shall apply to potable water supply systems:

a. Systems shall be designed to supply water at sufficient pressure to operate all fixtures and equipment during maximum demand. Supply capacity for hot- and cold-water piping shall be determined on the basis of fixture units, using recognized engineering standards. When the ratio of plumbing fixtures to occupants is proportionally more than required by the building occupancy and is in excess of 1,000 plumbing fixture units, a diversity factor is permitted.

b. Each water service main, branch main, riser, and branch to a group of fixtures shall have valves. Stop valves shall be provided for each fixture. Appropriate panels for access shall be provided at all valves where required.

c. Vacuum breakers or backflow prevention devices shall be installed on hose bibs and supply nozzles used for connection of hoses or tubing in ~~laboratories,~~ housekeeping sinks, bedpan-flushing attachments, ~~and autopsy tables,~~ etc.

d. Bedpan-flushing devices (may be cold water) shall be provided in each inpatient toilet room.

e. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.

f. Systems shall be protected against cross-connection in accordance with American Water Works Association (AWWA) *Recommended Practice for Backflow Prevention and Cross-Connection Control.*

10.31.E3. The following standards shall apply to hot water systems:

a. The water-heating system shall have sufficient supply capacity at the temperatures and amounts indicated in Table 7.4. Water temperature is measured at the point of use or inlet to the equipment. Water ~~shall~~ may be ~~permitted to be~~ stored at higher temperatures.

b. Hot-water distribution systems serving patient care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet. Non-recirculated fixture branch piping shall not exceed 25 feet (7.62 meters) in length.

*c. Provisions shall be included in the domestic hot water system to limit the amount of *Legionella* bacteria and opportunistic waterborne pathogens.

d. Dead-end piping (risers with no flow, branches with no fixture) shall not be installed. In renovation projects, dead-end piping shall be removed. Empty risers, mains, and branches installed for future use shall be permitted.

10.31.E4. The following standards shall apply to drainage systems:

a. Drain lines from sinks used for acid waste disposal shall be made of acid-resistant material.

b. Drain lines serving some types of automatic blood-cell counters ~~must~~ shall be of carefully selected material that will eliminate potential for undesirable chemical reactions (and/or explosions) between sodium azide wastes and copper, lead, brass, ~~and~~ solder, etc.

c. Insofar as possible, drainage piping shall not be installed within the ceiling or exposed in operating rooms, food preparation centers, food serving facilities, food storage areas, central services, electronic data processing areas, electric closets, and other sensitive areas. Where exposed~~,~~ overhead drain piping in these areas is unavoidable, special provisions shall be made to protect the space below from leakage, condensation, or dust particles.

d. Floor drains shall not be installed in operating rooms.

e. If a floor drain is installed in cystoscopy, it shall contain a nonsplash, horizontal-flow flushing bowl

beneath the drain plate.

f. Drain systems for autopsy tables shall be designed to positively avoid splatter or overflow onto floors or back siphonage and for easy cleaning and trap flushing.

g. Building sewers shall discharge into community sewerage. Where such a system is not available, the facility shall treat its sewage in accordance with local and state regulations.

h. Kitchen grease traps shall be located and arranged to permit easy access without the need to enter food preparation or storage areas. Grease traps shall be of capacity required and shall be accessible from outside ~~of~~ the building without need to interrupt any services.

i. Where plaster traps are used, provisions shall be made for appropriate access and cleaning.

j. In dietary areas, floor drains and/or floor sinks shall be of type that can be easily cleaned by removal of cover. ~~Provide f~~Floor drains or floor sinks shall be provided at all "wet" equipment (as ice machines) and as required for wet cleaning of floors. ~~Provide r~~Removable stainless steel mesh in addition to grilled drain covers shall be provided to prevent entry of large particles of waste ~~which~~ that might cause stoppages. Location of floor drains and floor sinks shall be coordinated to avoid conditions where locations of equipment make removal of covers for cleaning difficult.

10.31.E5. The installation, testing, and certification of nonflammable medical gas and air systems shall comply with the requirements of NFPA 99. (See Table 7.5 for rooms requiring station outlets.)

10.31.E6. Clinical vacuum system installations shall be in accordance with NFPA 99. (See Table 7.5 for rooms ~~which~~ requir~~e~~ing station outlets.)

10.31.E7. All piping, except control-line tubing, shall be identified. All valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.

10.31.E8. Where the functional program includes hemodialysis, continuously circulated filtered cold water shall be provided. Piping shall be in accordance with ANSI/AAMI RD62, *Water Treatment Equipment for Hemodialysis Applications*.

10.31.E9. ~~Provide c~~Condensate drains for cooling coils shall be of a type that ~~may~~ can be cleaned as needed without disassembly. (Unless specifically required by local authorities, traps are not required for condensate drains.) ~~Provide~~ An air gap shall be provided where condensate drains empty into floor drains. ~~Provide h~~Heater elements shall be provided for condensate lines in freezers or other areas where freezing may be a problem.

10.31.E10. No plumbing lines ~~may~~ shall be exposed overhead or on walls where possible accumulation of dust or soil may create a cleaning problem or where leaks would create a potential for food contamination.

10.32. Electrical Standards

10.32.A. General

10.32.A1. All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99 and shall be listed as complying with available standards of listing agencies or other similar established standards where such

standards are required.

10.32.A2. The electrical installations, including alarm, nurse call, and communication systems, shall be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment shall show compliance with applicable codes and standards.

10.32.A3. Data processing and/or automated laboratory or diagnostic equipment, if provided, may require safeguards from power line disturbances.

10.32.B. Services and Switchboards

Main switchboards shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only. Switchboards shall be convenient for use, readily accessible for maintenance, away from traffic lanes, and located in dry, ventilated spaces free of corrosive or explosive fumes, gases, or any flammable material. Overload protective devices shall operate properly in ambient room temperatures.

10.32.C. Panelboards

Panelboards serving normal lighting and appliance circuits shall be located on the same floor as the circuits they serve. Panelboards serving critical branch emergency circuits shall be located on each floor that has major users. Panelboards serving ~~L~~life ~~S~~safety emergency circuits may also serve floors above and/or below.

10.32.D. Lighting

10.32.D1. Lighting shall be engineered to the specific application.

10.32.D2. The Illuminating Engineering Society of North America (IES) has developed recommended lighting levels for health care facilities. ~~The reader should r~~Refer to the IES publication RP-29, *Lighting for Hospitals and Health Care Facilities*.~~*IES Handbook* (1993).~~

10.32.D3. Approaches to buildings and parking lots and all occupied spaces shall have lighting fixtures ~~for lighting~~ that can be illuminated as necessary.

10.32.D4. Patient rooms shall have general lighting and night lighting. A reading light shall be provided for each patient. Reading light controls shall be readily accessible to the patient(s). Incandescent and halogen light sources ~~which~~ that produce heat ~~should~~ shall be avoided to prevent burns to the patient and/or bed linen. Unless specifically designed to protect the space below, ~~T~~the light source ~~should~~ shall be covered by a diffuser or lens.

10.32.D5. Nursing unit corridors shall have general illumination with provisions for reducing light levels at night.

10.32.D6. Consideration should be given to the special needs for the elderly. Excessive contrast in lighting levels that make effective sight adaptation difficult should be minimized. Refer to IES publication RP-28, *Lighting and the Visual Environment for Senior Living*.

10.32.E. Receptacles (Convenience Outlets)

10.32.E1. Each patient room shall have duplex-grounded receptacles. There shall be one at each side of the head of each bed and one on every other wall. Receptacles may be omitted from exterior walls where construction or room configuration makes installation impractical.

10.32.E2. Duplex-grounded receptacles for general use shall be installed approximately 50 feet (15.24 meters) apart in all corridors and within 25 feet (7.62 meters) of corridor ends.

10.32.E3. Electrical receptacle cover plates or electrical receptacles supplied from the emergency system shall be distinctively colored or marked for identification. If color is used for identification purposes, the same color ~~should~~ shall be used throughout the facility.

10.32.F. Equipment

10.32.F1. Ground-fault circuit interrupters (GFCIs) shall comply with NFPA 70. ~~When~~ Where GFCIs are used in critical areas, provisions shall be made to ensure that other essential equipment is not affected by activation of one interrupter.

10.32.F2. Fixed and mobile x~~X~~-ray equipment installations shall conform to articles 517 and 660 of NFPA 70.

10.32.F3. Special equipment is identified in the following sections: Nursing Units (10.15), Support Areas, ~~Rehabilitation~~ Physical Therapy (10.17), Occupational Therapy (10.18), and Imaging (10.2.E) if applicable. These sections shall be consulted to ensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

10.32.G. Nurse Calling System

10.32.G1. A nurse~~s~~ calling system shall be provided. Each bed shall be provided with a call device. Two call devices serving adjacent beds may be served by one calling station. Calls shall activate a visible signal in the corridor at the patient's door or other appropriate location. In multicorridor nursing units, additional visible signals shall be installed at corridor intersections.

10.32.G2. A nurses emergency call shall be provided at each inpatient toilet, bath, sitz bath, and shower room. This emergency call shall be accessible to a collapsed patient lying on the floor. Inclusion of a pull cord will satisfy this standard. The emergency call shall be designed so that a signal activated at a patient's calling station will initiate a visible and audible signal distinct from the regular nurse calling system that can be turned off only at the patient calling station. The signal shall activate an annunciator panel at the nurses' station or other appropriate location, a visible signal in the corridor at the patient's door, and at other areas defined by the functional program.

10.32.G3. Alternate technologies ~~can~~ ~~may~~shall be permitted ~~considered~~ for emergency or nurse call systems. If radio frequency systems are utilized, consideration ~~should~~ shall be given to electromagnetic compatibility between internal and external sources.

10.32.H. Emergency Electrical Service

10.32.H1. As a minimum, nursing facilities or sections thereof shall have emergency electrical systems as required in NFPA 101, NFPA 110, and NFPA 99.

10.32.H2. ~~When~~ Where the nursing facility is a distinct part of an acute-care hospital, it may use the emergency generator system for required emergency lighting and power, if such sharing does not reduce hospital services. Such a shared system shall be designed with the capacity to meet the needs of both the hospital and rehabilitation facilities. Life support systems and their respective areas shall be subject to applicable standards of Section 7.32.

10.32.H3. An emergency electrical source shall provide lighting and/or power during an interruption of the normal electric supply.

10.32.I. Fire Alarm System
Fire alarm and detection systems shall be provided in compliance with NFPA 101 and NFPA 72.

10.32.J. Telecommunications and Information Systems

10.32.J1. Locations for terminating telecommunications and information system devices shall be provided.

10.32.J2. An area shall be provided for central equipment locations. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

A10.7.A. Services may consist of an on-site conventional food preparation system, a convenience food service system, or an appropriate combination thereof. On-site facilities should be provided for emergency food preparation and refrigeration.

A10.31.A5. Systems with excessive installation and/or maintenance costs that negate long-range energy savings should be avoided.

A10.31.D5. One way to achieve basic humidification is ~~may be accomplished~~ by using a steam--jacketed manifold--type humidifier, with a condensate separator that delivers high-quality steam. Additional booster humidification (if required) should be provided by steam--jacketed humidifiers for each individually controlled area. Steam to be used for humidification may be generated in a separate steam generator. The steam generator feed water may be supplied either from soft or reverse osmosis water. Provisions should be made for periodic leaning.

A10.31.E3.c. There are several ways to treat domestic water systems to kill *Legionella* and opportunistic waterborne pathogens. Complete removal of these organisms is not feasible, but methods to reduce the amount include hyperchlorination (free chlorine, chlorine dioxide, monochloramine), elevated hot water temperature, ozone injection, silver/copper ions, and ultraviolet light. Each of these options has advantages and disadvantages. While increasing the hot water supply temperature to 140°F (60°C) is typically considered the easiest option, the risk of scalding, especially to youth and the elderly, is significant. Additional consideration should be given to domestic water used in bone marrow transplant units. See CDC, ASHRAE, and ASPE documentation for additional information.

11. PSYCHIATRIC HOSPITAL

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

11.1 General Conditions

11.1.A. Applicability
This section covers a psychiatric hospital intended for the care and treatment of inpatients and outpatients who do not require acute medical/surgical care services. See Section 7.6 for psychiatric units within acute care hospitals.

11.1.B. Functions
(See Section 1.1.F.)

11.1.C. Parking
In the absence of a formal parking study, the facility shall provide at least one space for each employee normally present during one weekday shift plus one space for every five beds, or a total of 1.5 per patient. This ratio may be reduced when justified by availability of convenient public transportation and public parking. Additional parking may be required for outpatients or other services.

11.1.D. Swing Beds
Occupancy of a group of rooms within the facility may be changed to accommodate different patient groups based on age, sex, security level, or treatment programs.

11.1.E. Services
When Where the psychiatric facility is part of another facility, services such as dietary, storage, pharmacy, and laundry should be shared insofar as practical. In some cases, all ancillary service requirements will be met by the principal facility. In other cases, programmatic concerns and requirements may dictate separate services.

***11.1.F. Environment of Care**
The facility should shall provide a therapeutic environment appropriate for the planned treatment programs. The design shall provide the level of Ssecurity appropriate for the planned treatment programs shall be provided.

Special design considerations for injury and suicide prevention shall be given to the following elements:

The unit should be characterized by a feeling of openness, with emphasis on natural light and exterior view. Interior finishes, lighting, and furnishings should suggest a residential rather than an institutional setting. These should, however, conform with applicable fire safety codes. Security and safety devices should not be presented in a manner to attract or challenge tampering by patients. Design, finishes, and furnishings should be such as to minimize the opportunity for residents to cause injury to themselves or others. Special design considerations for injury and suicide prevention shall be given to the following elements:

? Visual control of nursing units and passive activity areas such as dayrooms and outdoor areas.

? Hidden alcoves or enclosed spaces.

? Areas secured from patients such as staff areas and mechanical space.

11.1.F1. Door closers, latch handles, and hinges. Door closers are to be avoided unless required. Door closer devices, if required on the patient room door, shall be mounted on the public side of the door rather than the private patient side of the door. Ideally, the door closer (if required) should be within view of a nurse or staff workstation. Door hinges shall be designed to minimize points for hanging (i.e., cut hinge type) and to be consistent with the level of care for the patient. Door lever handles shall point downward when in the latched position. All hardware shall have tamper-resistant fasteners.

11.1. F2. Clothing storage. Clothing rods or hooks, if present, shall be designed to minimize the opportunity for residents to cause injury. Furniture shall be constructed such that it can withstand physical abuse. Drawer pulls shall be of the recessed type to eliminate the possibility of becoming a tie-off point.
?

11.1.F3. Door swings to private patient bathrooms. Door swings for bathrooms or shower areas shall swing out to allow for staff emergency access. The ceiling shall be of the tamper-resistive type or of sufficient height to prevent patient access. Ceiling systems of a non-secured (non-clipped down) lay-in ceiling tile design are not permitted. Any plumbing, piping, ductwork, or other potentially hazardous elements shall be concealed above a ceiling. Air distribution devices, lighting fixtures, sprinkler heads, and other appurtenances shall be of the tamper-resistant type.

11.1.F4. Shower, bath, toilet, and sink plumbing fixtures, hardware, and accessories, including grab bars and toilet paper holders. ADA- or ANSI-compliant grab bars are required in 10 percent of the patient private/semi-private toilet rooms. The remaining rooms are not required to have grab bars. Grab bars in patient toilet rooms for fully ambulatory patients shall be removeable. Towel bars are not permitted. Shower curtain rods are not permitted. Shower heads shall be of the flush mounted design to minimize hanging appendages. Lever handles are not permitted.
?

? ***11.1.F5.** Windows, including interior and exterior glazing. All glazing, borrow lights, and glass mirrors shall be fabricated with laminated safety glass or shall be protected by polycarbonate, laminate, or safety screens.

11.1.F6. Light fixtures, electrical outlets, electrical appliances, nurse call systems, and staff emergency assistance systems. Electrical receptacles in patient rooms shall not allow for unauthorized use or shall be protected with a ground fault circuit interrupter. Staff response call systems shall be low voltage, current limited, and shall not allow for unauthorized use.

? **11.1.F7.** Ceilings, ventilation grilles, and access panels in patient bedrooms and bathrooms. Where acoustical ceilings are permitted by the functional program, they shall be of sufficient height or be secured to prevent patient access. In unsupervised patient areas, sprinkler heads shall be recessed or of a design to minimize patient access. Ceiling access panels and light fixtures shall be secured or shall be of sufficient height to prevent patient access. Ventilation grills shall be secured and have small perforations to eliminate their use as a tie-off point, or shall be of sufficient height to prevent patient access.

? **11.1.F8.** Sprinkler heads and other protrusions.

? **11.1.F9.** Fire extinguisher cabinets and fire alarm pull stations. They shall be located in staff areas or

otherwise secured if in patient-accessible locations.

11.2 General Psychiatric Nursing Unit

Each nursing unit shall include the following (see Section 1.3 for exceptions to standards where existing conditions make absolute compliance impractical).

11.2.A. Patient Rooms
Each patient room shall meet the following standards:

11.2.A1. Maximum room capacity shall be two patients.

11.2.A2. Patient room areas, exclusive of toilet rooms, closets, lockers, wardrobes, alcoves, or vestibules, shall be at least 100 square feet (9.29 square meters) for single-bed rooms and 80 square feet (7.43 square meters) per bed for multiple-bed rooms. Minor encroachments, including columns and lavatories, *that do not interfere with functions* may be ignored when determining space requirements for patient rooms. The areas noted herein are intended as ~~recognized~~ minimums and do not prohibit use of larger rooms where required ~~for needs and functions~~ by the functional program.

Security rooms may be included if required by the ~~treatment~~functional program. Security rooms shall be single-bed rooms designed to minimize potential for escape, hiding, injury to self or others, or suicide. Access to toilets, showers, and wardrobes shall be restricted. Security rooms may be centralized on one unit or decentralized among units.

11.2.A3. Each patient room shall have a window in accordance with Section 7.29.A10.~~Windows or vents in psychiatric units shall be arranged and located so that they can be opened from the inside to permit venting of combustion products and to permit any occupant direct access to fresh air in emergencies. The operation of operable windows shall be restricted. Where windows or vents require the use of tools or keys for operation, the tools or keys shall be located on the same floor in a prominent location accessible to staff. Windows in buildings designed with approved, engineered smoke-control systems may be fixed construction. Security glazing and/or other appropriate security features shall be used at all windows of the nursing unit and other patient activity and treatment areas to reduce the possibility of patient injury or escape.~~

11.2.A4. Each patient shall have access to a toilet room without having to enter the general corridor area. (This direct access requirement may be disregarded if it conflicts with the supervision of patients as required by the ~~treatment~~ functional program.)

One toilet room shall serve no more than four beds and no more than two patient rooms. The toilet room shall contain a water closet and a handwashing station, and the door ~~should~~ shall swing outward or be double acting.

11.2.A5. Each patient shall have within his or her room a separate wardrobe, locker, or closet suitable for hanging full-length garments and for storing personal effects. Adequate storage ~~should~~ shall be available for a daily change of clothes for seven days. Where the ~~treatment~~ functional program indicates, shelves for folded garments may be used instead of hanging garments.

11.2.A6. There shall be a desk or writing surface in each room for patient use.

11.2.B. ~~Service~~ Support Areas

Provisions for the ~~services~~ support areas noted ~~below~~ in Sections 11.2.B1 through 11.2.B27 shall be located in or ~~be~~ readily available to each nursing unit. Each service area may be arranged and located to serve more than one nursing unit but, unless noted otherwise, at least one such service area shall be provided on each nursing floor. Where the words *room* or *office* are used, a separate, enclosed space for the one named function is intended; otherwise, the described area may be a specific space in another room or common area.

11.2.B1. Administrative center or nurse station.

11.2.B2. Office(s) for staff.

11.2.B3. Administrative supplies storage.

11.2.B4. Handwashing stations (see Section 7.2.B4).

11.2.B5. A separate charting area ~~shall be provided~~ with provisions for acoustical and patient file privacy.

11.2.B6. Toilet room(s) for staff.

11.2.B7. Staff lounge facilities.

11.2.B8. Securable closets or cabinet compartments for the personal effects of nursing personnel, conveniently located to the duty station. At a minimum, these shall be large enough for purses and billfolds.

11.2.B9. Clean workroom or clean holding room (see Section 7.2.B11).

11.2.B10. Soiled workroom (see Section 7.2.B12).

11.2.B11. ~~Drug distribution~~Medication station (see Section 7.2.B13).

11.2.B12. Clean linen storage (see Section 7.2.B14).

11.2.B13. Food service. Food service within the unit may be one or a combination of the following:

a. A nourishment station.

b. A kitchenette designed for patient use with staff control of heating and cooking devices.

c. A kitchen service within the unit including a handwashing station, storage space, refrigerator, and facilities for meal preparation.

11.2.B14. Ice machine (see Section 7.2.B16).

11.2.B15. Bathing facilities. A bathtub or shower shall be provided for each six beds not otherwise served by bathing facilities within the patient rooms. Bathing facilities ~~should~~ shall be designed and located for patient convenience and privacy.

11.2.B16. Social spaces. At least two separate social spaces, one appropriate for noisy activities and one for quiet activities, shall be provided. The combined area shall be at least 25 square feet (2.32 square meters) per patient with at least 120 square feet (11.15 square meters) for each of the two spaces. This space may be shared by dining activities if an additional 15 square feet (1.39 square meters) per patient is added; otherwise, ~~provide~~ 20 square feet (1.86 square meters) per patient shall be provided for dining. Dining facilities may be located off the nursing unit in a central area.

11.2.B17. Space for group therapy ~~shall be provided~~. This may be combined with the quiet space noted ~~above~~ in Section 11.2.B16 when the unit accommodates not more than 12 patients and when at least 225 square feet (20.90 square meters) of enclosed private space is available for group therapy activities.

11.2.B18. Patient laundry facilities with an automatic washer and dryer ~~shall be provided~~.

11.2.B19. A staff-controlled secured storage area for patients' effects determined potentially harmful (razors, nail files, cigarette lighters, etc.). ~~This area will be controlled by staff.~~

The following elements shall also be provided, but may be either within the psychiatric unit or immediately accessible to it unless otherwise dictated by the program:

11.2.B20. Equipment storage room. Storage space for wheelchairs may be outside the psychiatric unit, provided that provisions are made for convenient access as needed for disabled patients.

11.2.B21. Examination and treatment room(s). These ~~examination and treatment room(s)~~ may serve several nursing units and may be on a different floor if conveniently located for routine use. Examination rooms shall have a minimum floor area of 120 square feet (11.15 square meters), excluding space for vestibule, toilets, and closets. The room shall contain a handwashing station; storage facilities; and a desk, counter, or shelf space for writing.

11.2.B22. Emergency equipment storage. Space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a CPR cart. This space shall be in close proximity to a nurse station; it may serve more than one unit.

11.2.B23. Housekeeping room (see Section 7.2.B22).

11.2.B24. A visitor room for patients to meet with friends or family with a minimum floor space of 100 square feet (9.29 square meters).

11.2.B25. A quiet room for a patient who needs to be alone for a short period of time but does not require a seclusion room. A minimum of 80 square feet (7.43 square meters) shall be provided ~~is required~~. The visitor room may serve this purpose.

11.2.B26. Separate consultation room(s) with minimum floor space of 100 square feet (9.29 square meters) each, provided at a room-to-bed ratio of one consultation room for each 12 psychiatric beds. The room(s) shall be designed for acoustical and visual privacy and constructed to achieve a level of voice privacy of 50 STC (which in terms of vocal privacy means some loud or raised speech is heard only by straining, but is not intelligible). The visitor room may serve as a consultation room.

11.2.B27. A conference and treatment planning room for use by the psychiatric unit. This room may be combined with the charting room.

11.2.C. Seclusion Treatment Room
There shall be at least one seclusion room on each psychiatric unit ~~for up to 24 beds or a major fraction thereof~~. The seclusion treatment room is intended for short-term occupancy ~~by violent or suicidal patients~~. Within the psychiatric nursing unit, this space provides for patients requiring security and protection. The room(s) shall be located for direct nursing staff supervision. Each room shall be for only one patient.

~~It~~ Seclusion treatment rooms shall have an area of at least 60 square feet (5.6 square meters) with a minimum dimensional wall length of 7 feet (2.13 meters) and a maximum wall length of 11 feet (3.35 meters), and shall be constructed to prevent patient hiding, escape, injury, or suicide. Where restraint beds are required by the functional program, 80 square feet (7.43 square meters) shall be required.

If a facility has more than one psychiatric nursing unit, the number of seclusion rooms shall be a function of the total number of psychiatric beds in the facility. Seclusion rooms may be grouped together.

Seclusion treatment rooms shall not contain outside corners or edges. ~~Special fixtures and hardware for electrical circuits shall be used.~~ Electrical switches and receptacles are prohibited within the seclusion room. The entrance door to the seclusion room shall swing out. Doors shall be 3 feet 8 inches (1.12 meters) wide and shall permit staff observation of the patient through a vision panel, while also maintaining provisions for patient privacy. Minimum ceiling height shall be 9 feet (2.74meters).

Seclusion treatment rooms shall be accessed by an anteroom or vestibule that also provides ~~direct~~ access to a toilet room. The doors to the anteroom and the toilet room shall be a minimum of 3 feet 8 inches (1.12 meters) wide. ~~The toilet room and anteroom shall be large enough to safely manage the patient. The seclusion room door shall swing out.~~

Where the interior of the seclusion treatment room is padded with combustible materials, these materials shall be of a type acceptable to the local authority having jurisdiction. The room area, including floor, walls, ceilings, and all openings, shall be protected with not less than one-hour-rated construction.

11.2.D. The need for and number of required airborne infection isolation rooms in the psychiatric hospital shall be determined by an ~~Infection Control Risk Assessment (~~ICRA~~)~~. ~~When~~ Where required, the airborne infection isolation room(s) shall comply with the general requirements of Section 7.2.C.

***11.2.E. Outdoor Areas**

11.3 Child Psychiatric Unit

Child psychiatric unit patient areas shall be separate and distinct from any adult psychiatric unit patient areas. The standards of Section 11.2 shall be applied to child units with the following exceptions:

11.3.A. Patient Rooms

11.3.A1. Maximum room capacity shall be four children.

11.3.A2. Patient room (with beds or cribs) areas shall be at least 100 square feet (9.29 square meters) for single-bed rooms; 80 square feet (7.43 square meters) per bed and 60 square feet (5.57 square meters) per crib in multiple-bed rooms.

11.3.A3. Storage space shall be provided for toys, equipment, extra cribs and beds, and cots or recliners for parents who ~~might~~ may stay overnight.

11.3.B. ~~Service~~ Activity Areas

11.3.B1. The combined area for social activities shall be 35 square feet (3.25 square meters) per patient. The total area for social activities and dining space shall be a minimum of 50 square feet (15.24 square meters) per patient. If a separate dining space is provided, it shall be a minimum of 15 square feet (4.57 square meters) per patient.

***11.3.C. Outdoor Areas**

11.4 Geriatric, Alzheimer's, and Other Dementia Unit

The standards of Section 11.2 shall be applied to geriatric units with the following exceptions:~~.~~

11.4.A. Patient Rooms

11.4.A1. Patient room areas shall be at least 120 square feet (11.15 square meters) in single-~~-~~bed rooms and 200 square feet (18.58 square meters) in multiple-bed rooms.

11.4.A2. A nurses call system shall be provided in accordance with the standards ~~contained~~ in Section 7.3~~2~~3.H. Provisions shall be made for easy removal or for covering call button outlets. Call cords or strings in excess of 6 inches (115.24 centimeters) shall not be permitted.

11.4.A3. Each patient bedroom shall have storage for extra blankets, pillows, and linen.

11.4.A4. Doors to patient rooms shall be a minimum of 3 feet 8 inches wide (1.12 meters).

11.4.B. Support Service Areas

11.4.B1. Patients shall have access to at least one bathtub in each nursing unit.

11.4.B2. The standards of Section 11.2.B16 shall apply for social spaces, except that the combined area for social activities shall be 30 square feet (2.79 square meters) per patient.

11.4.B3. Storage space for wheelchairs shall be provided in the nursing unit.

11.5 Forensic Psychiatric Unit

The standards of Section 11.2 shall ~~be applied~~apply to forensic units. Forensic units shall have security vestibules or sally ports at the unit entrance. Specialized program requirements may indicate the need for additional treatment areas, police and courtroom space, and security considerations. Areas for ~~C~~children, juveniles, and adolescents shall be separated from ~~the~~ adult areas.

11.6 Radiology Suite

Radiology services are not required to be provided within a psychiatric hospital. If they are provided ~~within the hospital~~, the radiology suite shall comply with Section 7.10.

11.7 Nuclear Medicine

Nuclear medicine services are not required to be provided within a psychiatric hospital. If they are provided~~ within the hospital~~, the nuclear medicine area shall comply with Section 7.11.

11.8 Laboratory Suite

Required laboratory tests may be performed on-site or provided through a contractual arrangement with a laboratory service.

Provisions shall be made for the following procedures to be performed on-site: urinalysis, blood glucose, and electrolytes. Provisions shall also be ~~included~~ made for specimen collection and processing.

Minimum facilities on-site shall include a defined area with a laboratory lab counter, sink with water, refrigerated storage, storage for equipment and supplies, clerical area, and record storage.

11.9 Rehabilitation Therapy Department

11.9.A. General

Rehabilitation therapy in a psychiatric hospital is primarily for the diagnosis and treatment of mental functions but may also seek to address physical functions in varying degrees. It may contain one or several categories of services. If a formal rehabilitative therapy service is included in a project, the facilities and equipment shall be as necessary for the effective function of the program. Where two or more rehabilitative services are included, items may be shared~~,~~ as appropriate.

11.9.B. Common Elements

Each rehabilitative therapy department shall include the following, which may be shared or provided as separate units for each service.

11.9.B1. Office and clerical space. ~~with p~~Provision shall be made for filing and retrieval of patient records.

11.9.B2. ~~Where reception and control station(s) are required by the program, p~~Provision ~~shall be made~~ for visual control of waiting and activity areas, if reception and control station(s) are required by the functional program. (~~This~~Reception and control stations may be combined with office and clerical space.)

11.9.B3. Patient waiting area(s) out of traffic, with provision for wheelchairs. The waiting area may be omitted if not required by the functional program. (Patient waiting time for rehabilitation therapy should be minimized in a psychiatric hospital.) ~~The waiting area may be omitted if not required by the program.~~

11.9.B4. Patient toilets with handwashing stations accessible to wheelchair patients.

11.9.B5. A conveniently accessible housekeeping room and service sink for housekeeping use.

11.9.B6. A secured area or cabinet within the vicinity of each work area for securing staff personal effects.

11.9.B7. Convenient access to toilets and lockers.

11.9.B8. Access to a demonstration-conference room.

11.9.C. Physical Therapy
~~The~~ An individual's physical health ~~of a person~~ can have a direct effect on his or her mental health. Therefore, physical therapy may be desirable in a psychiatric hospital, especially for long-term care patients and elderly patients.

If physical therapy is ~~part of the service~~included in the functional program, the following~~, at least,~~ shall be ~~included~~provided.

11.9.C1. Individual treatment area(s) with privacy screens or curtains. Each such space shall have not less than 60 square feet (5.57 square meters) of clear floor area.

11.9.C2. Handwashing stations for staff either within or at each treatment space. (One handwashing station may serve several treatment stations.)

11.9.C3. Exercise area and facilities.

11.9.C4. Clean linen and towel storage.

11.9.C5. Storage for equipment and supplies.

11.9.C6. Separate storage for soiled linen, towels, and supplies.

11.9.C7. Dressing areas, showers, and lockers for outpatients~~ to be treated~~.

11.9.C8. Provisions ~~shall be made~~ for thermotherapy, diathermy, ultrasonics, and hydrotherapy when required by the functional program.

11.9.D. Occupational Therapy
Occupational therapy may include such activities as woodworking, leather tooling, art, needlework, painting, sewing, metal work, and ceramics. The following~~, at least,~~ shall be ~~included~~provided:

11.9.D1. Work areas and counters suitable for wheelchair access.

11.9.D2. Handwashing stations.

11.9.D3. Storage for supplies and equipment.

11.9.D4. Secured storage for potentially harmful supplies and equipment.

***11.9.D5.** A separate room or alcove for a kiln.

11.9.D6. Remote electrical switching for potentially harmful equipment.

11.9.D7. Work areas should be sized for one therapy group at a time.

***11.9.D8.** Display areas.

11.9.E. Vocational Therapy

Vocational therapy assists patients in the development and maintenance of productive work and interaction skills through the use of work tasks. These activities may occur in an industrial therapy workshop in another department or outdoors. If ~~this~~vocational therapy is ~~service is provided~~included in the functional program, the following~~, at least,~~ shall be ~~included~~provided:

11.9.E1. Work areas suitable for wheelchair access.

11.9.E2. Handwashing stations if required by the program.

11.9.E3. Storage for supplies and equipment.

11.9.E4. Secured storage for potentially harmful supplies and equipment.

11.9.E5. Remote electrical switching for potentially harmful equipment.

11.9.E6. Group work areas. These should be sized for one therapy group at a time.

11.9.F. Recreation Therapy

Recreation therapy assists patients in the development and maintenance of community living skills through the use of leisure-time activity tasks. These activities may occur in a recreation therapy department, in specialized facilities (e.g., gymnasium), multipurpose space in other areas (e.g., the nursing unit), or outdoors. If recreation therapy is ~~part of the service~~included in the functional program, ~~T~~the following~~, at least,~~ shall be ~~included~~provided:

11.9.F1. Activity areas suitable for wheelchair access.

11.9.F2. Handwashing stations if required by the program.

11.9.F3. Storage for supplies and equipment.

11.9.F4. Secured storage for potentially harmful supplies and equipment.

11.9.F5. Remote electrical switching for potentially harmful equipment.

11.9.G. Education Therapy

Education therapy may be a program requirement, especially for children and adolescents. If education therapy is part of the functional program~~the service is provided~~, the following~~, at least,~~ shall be ~~included~~provided.

11.9.G1. Classroom with student desks with 30 square feet (2.79 square meters) per desk ~~with~~ and at least 150 square feet (13.94 square meters) per classroom.

11.9.G2. Desk and lockable storage for the teacher.

11.9.G3. Storage for supplies, equipment, and books.

11.10 Pharmacy

11.10.A. General

As described in the functional program, the size and type of ~~services~~ facilities and equipment to be provided in the pharmacy will depend on the type of patients and illnesses treated, type of drug distribution system used, number of patients to be served, and extent of shared or purchased services. ~~This shall be described in the functional program.~~ The pharmacy room or suite shall be located for convenient access, staff control, and security. ~~Facilities and equipment shall be as necessary to accommodate the functions of the program and~~ It shall include provisions for procurement, storage, distribution, and recording of drugs and other pharmacy products. (Satellite facilities, if provided, shall include those items required by the program.)

11.11 Dietary Facilities

~~(~~See Section 7.18.~~)~~

11.12 Administration and Public Areas

~~(~~See Section 7.19.~~)~~

11.13 Medical Records

~~(~~See Section 7.20.~~)~~

11.14 Central Services

If only primary medical care is provided, central services may not be required or may be provided by countertop sterilizing/cleaning equipment. If decontamination and sterilization are required on-site, a full central services area shall be provided (see Section 7.21).

11.15 General Storage

General storage room(s) with a total area of not less than 4 square feet (0.37 square meters) per inpatient bed shall be provided. Storage may be in separate, concentrated areas within the institution or in one or more individual buildings on-site. A portion of this storage may be provided off-site.

11.16 Linen Services

~~(~~See Section 7.23.~~)~~

11.17 Facilities for Cleaning and Sanitizing Carts

~~(~~See Section 7.24.~~)~~

11.18 Employee Facilities

~~(~~See Section 7.25.~~)~~

11.19 Housekeeping Room

~~(~~See Section 7.26.~~)~~

11.20 Engineering Service and Equipment Area

~~(~~See Section 7.27.~~)~~

11.21 Waste Processing Services

~~(~~See Section 7.3~~0~~1.C.~~)~~

11.22 General Standards for Details and Finishes

Details and finishes ~~The standards of Section 11.22~~ shall comply with Section 7.28 with the following exceptions:

11.22.A. The minimum door width for patient use access in new work shall be at least 3 feet (0.91 meter).

11.22.B. Where grab bars are provided, the space between the bar and the wall ~~should~~ shall be filled to prevent a cord being tied around it for hanging. Bars, including those ~~which~~ that are part of such fixtures as soap dishes, shall be sufficiently anchored to sustain a concentrated load of 250 pounds (113.4 kilograms).

11.23 Design and Construction, Including Fire-Resistant Standards

~~(~~See Section 7.29.~~)~~

11.24-11.29 Reserved

11.30 Special Systems

11.30.A. General

11.30.A1. Prior to acceptance of the facility, all special systems shall be tested and operated to demonstrate to the owner or his designated representative that the installation and performance of these systems conform to design intent. Test results shall be documented for maintenance files.

11.30.A2. Upon completion of the special systems equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions, ~~a~~ parts lists, and complete procurement information including equipment numbers and descriptions. Operating staff persons shall also be provided with instructions for proper operation of systems and equipment. Required information shall include all safety or code ratings as needed.

11.30.A3. Insulation shall be provided surrounding special systems equipment to conserve energy, protect personnel, and reduce noise.

11.30.B. Elevators

11.30.B1. All buildings having patient facilities (such as bedrooms, dining rooms, or recreation areas) or services (such as diagnostic or therapeutic) located on other than the main entrance floor shall have electric or hydraulic elevators. Installation and testing of elevators shall comply with ANSI/ASME A17.1 for new construction and ANSI/ASME A17.3 for existing facilities. (See ASCE 7-93 for seismic design and control systems requirements for elevators.)

a. Elevators shall be equipped with a two-way automatic level-maintaining device with accuracy of ±1/4 inch (±6.4 millimeters).

b. Each elevator, except those for material handling, shall be equipped with an independent keyed switch for staff use for bypassing all landing button calls and responding to car button calls only.

c. Elevator call buttons shall be key controlled if required by the functional program, and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors. This is so that the light control feature will be overridden or disengaged should it encounter smoke at any landing.

11.30.B2. Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this section as well as all applicable safety regulations and codes.

11.30.C. Waste ~~Processing Services~~Management

~~**11.30.C1.** Storage and disposal. Facilities shall be provided for sanitary storage and treatment or disposal of waste using techniques acceptable to the appropriate health and environmental authorities. The functional program shall stipulate the categories and volumes of waste for disposal and shall stipulate the methods of disposal for each.~~

~~**11.30.C2.** Medical waste. Medical waste shall be disposed of either by incineration or other approved technologies. Incinerators or other major disposal equipment may be shared by two or more institutions.~~

~~a. Incinerators or other major disposal equipment may also be used to dispose of other medical waste where local regulations permit. Equipment shall be designed for the actual quantity and type of waste to be destroyed and should meet all applicable regulations.~~

~~b. Incinerators with 50 pounds per hour or greater capacities shall be in a separate room or outdoors; those with lesser capacities may be located in a separate area within the facility boiler room. Rooms and areas containing incinerators shall have adequate space and facilities for incinerator charging and cleaning, as well as necessary clearances for work and maintenance. Provisions shall be made for operation, temporary storage, and disposal of materials so that odors and fumes do not drift back into occupied areas. Existing approved incinerator installations, which are not in separate rooms or outdoors, may remain unchanged provided they meet the above criteria.~~

~~c. The design and construction of incinerators and trash chutes shall comply with NFPA 82.~~

~~*d. Heat recovery.~~

~~*e. Environmental guidelines.~~

***11.30.C1.** Collection and Storage. Waste collection and storage locations shall be determined by the facility as a component of the functional program. The functional program shall stipulate the categories and volumes of waste for disposal and the methods of handling and disposal of waste. The functional program shall outline the space requirements, including centralized waste collection and storage spaces. Size of spaces shall be determined based upon volume of projected waste and length of anticipated storage.

a. At docks or other waste removal areas, the functional program shall stipulate the location of compactors, balers, sharps, and recycling container staging. Red bag waste shall be staged in enclosed and secured areas. Biohazardous and environmentally hazardous materials, including mercury, nuclear reagent waste, and other regulated waste types, shall be segregated and secured.

b. If provided, regulated medical waste or infectious waste storage spaces shall have a floor drain, cleanable floor and wall surfaces, lighting, and exhaust ventilation, and should be safe from weather, animals and unauthorized entry. Refrigeration requirements for such storage facilities shall comply with state and/or local regulations.

11.30.C2 Waste Treatment and Disposal Technologies

*a. On-site hospital incinerators shall comply with federal, state, and local regulatory and environmental requirements. The design and construction of incinerators and trash chutes shall comply with NFPA 82.

*b. Types of non-incineration waste treatment technology(ies) shall be determined by the facility in conjunction with environmental, economic, and regulatory considerations. The functional program shall describe waste treatment technology components.

(1) In determining the location for a non-incineration technology, safe transfer routes, distances from waste sources, temporary storage requirements, as well as space requirements for treatment equipment shall be considered. The location of the technology shall not cause traffic problems as waste is brought in and out. Odor, noise, and the visual impact of medical waste operations on patients, visitors, public access and security shall be considered.

(2) Space requirements for such technologies shall be determined by the equipment requirements, including associated area for opening waste entry doors, access to control panels, space for hydraulic lifts, conveyors, and operational clearances. Mobile or portable units, trailer-mounted units, underground installations, or all-weather enclosed shelters at an outdoor site may also be used, subject to local regulatory approvals.

(3) Exhaust vents, if any, from the treatment technology shall be located a minimum of 75 feet (22.86 meters) from inlets to HVAC systems. If the technology involves heat dissipation, sufficient cooling and ventilation shall be provided.

11.31 Mechanical Standards

11.31.A. General

***11.31.A1.** The mechanical system ~~should~~ shall be designed for overall efficiency and appropriate life-

cycle cost. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually. Recognized engineering procedures shall be followed for the most economical and effective results. ~~A well-designed system can generally achieve energy efficiency at minimal additional cost and simultaneously provide improved patient comfort. Different geographic areas may have climatic and use conditions that favor one system over another in terms of overall cost and efficiency.~~ In no case shall patient care or safety be sacrificed for conservation.

Mechanical, electrical, and HVAC equipment may be located either internally, externally, or in separate buildings. **[Clemson: Necessary? Are there any other options?]**

11.31.A2. Remodeling and work in existing facilities may present special problems. As practicality and funding permit, existing insulation, weather stripping, etc., should be brought up to standard for maximum economy and efficiency. Consideration shall be given to additional work that may be needed to achieve this.

11.31.A3. Facility design consideration shall include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.

11.31.A4. Insofar as practical, the facility should include provisions for recovery of waste cooling and heating energy (ventilation, exhaust, water and steam discharge, cooling towers, incinerators, etc.).

11.31.A5. Facility design consideration shall include recognized energy-saving mechanisms such as variable-air-volume systems, load shedding, programmed controls for unoccupied periods (nights and weekends, etc.) and use of natural ventilation, site and climatic conditions permitting. Systems with excessive installation and/or maintenance costs that negate long-range energy savings should be avoided.

11.31.A6. Air-handling systems shall be designed with an economizer cycle where appropriate to use outside air. Use of mechanically circulated outside air does not reduce need for filtration.

11.31.A.7. Mechanical equipment, ductwork, and piping shall be mounted on vibration isolators as required to prevent unacceptable structure-borne vibration.

11.31.A8. Supply and return mains and risers for cooling, heating, and steam systems shall be equipped with valves to isolate the various sections of each system. Each piece of equipment shall have valves at the supply and return ends.

11.31.B. Thermal and Acoustical Insulation

11.31.B1. Insulation within the building shall be provided to conserve energy, protect personnel, prevent vapor condensation, and reduce noise.

11.31.B2. Insulation on cold surfaces shall include an exterior vapor barrier. (Material that will not absorb or transmit moisture will not require a separate vapor barrier.)

11.31.B3. Insulation, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less as determined by an independent testing laboratory in accordance with NFPA 255.

11.31.B4. If duct lining is used, it shall be coated and sealed, and shall meet ASTM C1071. These linings

(including coatings, adhesives, and exterior surface insulation on pipes and ducts in spaces used as air supply plenums) shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as determined by an independent testing laboratory in accordance with NFPA 255. If existing lined ductwork is reworked in a renovation project, the liner seams and punctures shall be resealed.

11.31.B5. Existing accessible insulation within areas of facilities to be modernized shall be inspected, repaired, and/or replaced, as appropriate.

11.31.B6. Duct lining shall not be installed within 15 feet (4.57 meters) downstream of humidifiers.

11.31.C. Steam and Hot Water Systems

11.31.C1. Boilers shall have the capacity, based upon the net ratings published by the Hydronics Institute or another acceptable national standard, to supply the normal heating, hot water, and steam requirements of all systems and equipment.

11.31.D. Heating, Ventilation, and Air Conditioning~~,~~ (HVAC) ~~Heating, and Ventilation~~ Systems

11.31.D1. All rooms and areas ~~in the facility~~ used for patient care shall have provisions for ventilation. The ventilation rates shown in Table 7.2 shall be used only as minimum standards; they do not preclude the use of higher, more appropriate rates. Fans serving exhaust systems shall be located at the discharge end and shall be readily serviceable. Air supply and exhaust in rooms for which no minimum total air change rate is noted may vary down to zero in response to room load. For rooms listed in Table 7.2, where VAV systems are used, minimum total air change shall be within limits noted. ~~Temperature control shall also comply with these standards.~~ Space temperature and relative humidity shall be as indicated in Table 7.2. The ventilation systems shall be designed and balanced according to the requirements shown in Table 7.2 and in the applicable notes.

For renovation projects, prior to the start of construction and preferably during design, airflow and static pressure measurements shall be taken at the connection points of new ductwork to existing systems. This information shall be used by the designer to determine if existing systems have sufficient capacity for intended new purposes, and so any required modifications to the existing system can be included in the design documentation.

11.31.D2. General exhaust systems may be combined to enhance the efficiency of recovery devices required for energy conservation. Local exhaust systems shall be used ~~whenever~~ wherever possible in place of dilution ventilation to reduce exposure to hazardous gases, vapors, fumes, or mists.

Exhaust outlets from areas that may be contaminated shall be above roof level, arranged to minimize recirculation of exhaust air into the building, and directed away from personnel service areas.

11.31.D3. Fresh air intakes shall be located at least 25 feet (7.62 meters) from exhaust outlets of ventilating systems, combustion equipment stacks, medical-surgical vacuum systems, plumbing vents, or areas that may collect vehicular exhaust or other noxious fumes. (Prevailing winds and/or proximity to other structures may require greater clearances.) Plumbing and vacuum vents that terminate at a level above the top of the air intake may be located as close as 10 feet (3.05 meters). The bottom of outdoor air intakes serving central systems shall be as high as practical, but at least 6 feet (1.83 meters) above ground level, or, if installed above the roof, 3 feet (0.91 meter) above roof level. ~~Exhaust outlets from areas that may be contaminated shall be above roof level, arranged to minimize recirculation of exhaust air into the~~

~~building, and directed away from personnel service areas.~~

11.31.D4. All central ventilation or air conditioning systems shall be equipped with filters with efficiencies equal to, or greater than, those specified in Table 11.1. Filter efficiencies, tested in accordance with ASHRAE 52.1-1992, shall be average. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing duct~~-~~work. All joints between filter segments and enclosing duct~~-~~work shall have gaskets or seals to provide a positive seal against air leakage. A manometer shall be installed across each filter bed having a required efficiency of 75 percent or more. Provisions shall be made to allow access for field testing.

***11.31.D5.** If duct humidifiers are located upstream of the final filters, they shall be ~~located~~ at least 15 feet (4.57 meters) upstream of the final filters. Ductwork with duct-mounted humidifiers shall have a means of water removal. An adjustable high-limit humidistat shall be located downstream of the humidifier to reduce the potential for condensation inside the duct. All duct takeoffs shall be sufficiently downstream of the humidifier to ensure complete moisture absorption. Steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.

11.31.D6. Air-handling duct systems shall be designed with accessibility for duct cleaning~~,~~ and shall meet the requirements of NFPA 90A.

11.31.D7. Ducts that penetrate construction intended for ~~X~~x-ray or other ray protection shall not impair the effectiveness of the protection.

11.31.D8. Fire and smoke dampers shall be constructed, located, and installed in accordance with the requirements of NFPA 101, 90A, and the specific damper's ~~L~~listing requirements. Fans, dampers, and detectors shall be interconnected so that damper activation will not damage ducts. Maintenance access shall be provided at all dampers. All damper locations ~~should~~ shall be shown on design drawings. Dampers ~~should~~ shall be activated by fire or smoke sensors, not by fan cutoff alone. Switching systems for restarting fans may be installed for fire department use in venting smoke after a fire has been controlled. However, provisions should be made to avoid possible damage to the system due to closed dampers. When smoke partitions are required, heating, ventilation, and air conditioning zones shall be coordinated with compartmentation insofar as practical to minimize need to penetrate fire and smoke partitions.

11.31.D9. Exhaust hoods handling grease-laden vapors in food preparation centers shall comply with NFPA 96. All hoods over cooking ranges shall be equipped with grease filters, fire extinguishing systems, and heat-actuated fan controls. Cleanout openings shall be provided every 20 feet (6.10 meters)~~,~~ and at changes in direction~~,~~ in the horizontal exhaust duct systems serving these hoods. (Horizontal runs of ducts serving range hoods should be kept to a minimum.)

11.31.D10. Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit work~~-~~station temperatures.

11.31.D11. Gravity exhaust may be used, where conditions permit, for nonpatient areas such as boiler rooms, central storage, etc.

11.31.D12. The energy-saving potential of variable air volume systems is recognized, and these standards ~~herein~~ are intended to maximize appropriate use of ~~that~~ such systems. Any system ~~utilized~~ used for occupied areas shall include provisions to avoid air stagnation in interior spaces where thermostat demands are met by temperatures of surrounding areas.

11.31.D13. Special consideration shall be given to the type of heating and cooling units, ventilation outlets, and appurtenances installed in patient-occupied areas. The following shall apply:

a. All air grilles and diffusers shall be of a type that prohibits the insertion of foreign objects. All exposed fasteners shall be tamper-resistant.

b. All convector or HVAC enclosures exposed in the room shall be constructed with rounded corners and shall have enclosures fastened with tamper-resistant screws.

c. HVAC equipment shall be of a type that minimizes the need for maintenance within the room.

11.31.D14. Rooms used for sputum induction, aerosolized pentamidine treatments, and other cough-inducing procedures shall meet the requirements of Table 7.2 for airborne infection isolation rooms. If booths are used, refer to Section 7.~~15~~16.E.

11.31.D15. Non~~-~~central air-~~-~~handling systems~~,~~ (i.e., individual room units that are used for heating and cooling purposes) (fan-coil units, heat pump units, etc.) shall be equipped with permanent (cleanable) or replaceable filters. The filters shall have a minimum efficiency of 68 percent weight arrestance (MERV 3). These units may be used as recirculating units only. All outdoor requirements shall be met by a separate central air-handling system with the proper filtration, as noted in Table 11.1.

11.31.E. Plumbing and Other Piping Systems
Unless otherwise specified herein, all plumbing systems shall be designed and installed in accordance with *National Standard Plumbing Code*, chapter 14, Medical Care Facility Plumbing Equipment.

11.31.E1. Plumbing fixtures. See Section 7.32.E1. ~~The following standards shall apply to plumbing fixtures:~~

~~a. The material used for plumbing fixtures shall be nonabsorptive and acid-resistant.~~

~~b. Water spouts used in lavatories and sinks shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc.~~

~~c. General handwashing stations used by medical and nursing staff and all lavatories used by patients and food handlers shall be trimmed with valves that can be operated without hands. (Single lever or wrist blade devices may be used.) Blade handles used for this purpose shall not exceed 4 1/2 inches (114.3 millimeters) in length. Handles on clinical sinks shall be at least 6 inches (152.4 millimeters) long. Freestanding scrub sinks and lavatories used for scrubbing in procedure rooms shall be trimmed with foot, knee, or ultrasonic controls (no single lever wrist blades).~~

~~d. Clinical sinks shall have an integral trap wherein the upper portion of the water trap provides a visible seal.~~

~~e. Showers and tubs shall have nonslip walking surfaces.~~

11.31.E2. ~~The following standards shall apply to p~~Potable water supply systems. See Section 7.32.E2.~~:~~

~~a. Systems shall be designed to supply water at sufficient pressure to operate all fixtures and equipment~~

during maximum demand. Supply capacity for hot- and cold-water piping shall be determined on the basis of fixture units, using recognized engineering standards. When the ratio of plumbing fixtures to occupants is proportionally more than required by the building occupancy and is in excess of 1,000 plumbing fixture units, a diversity factor is permitted.

b. Each water service main, branch main, riser, and branch to a group of fixtures shall have valves. Stop valves shall be provided for each fixture. Appropriate panels for access shall be provided at all valves where required.

c. Vacuum breakers shall be installed on hose bibs and supply nozzles used for connection of hoses or tubing in laboratories, housekeeping sinks, bedpan flushing attachments, and autopsy tables, etc.

d. Bedpan flushing devices (may be cold water) shall be provided in each inpatient toilet room; however, installation is optional in psychiatric and alcohol abuse units where patients are ambulatory.

e. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.

11.31.E3. The following standards shall apply to hHot water systems. See Section 7.32E3.:

a. The water-heating system shall have sufficient supply capacity at the temperatures and amounts indicated in Table 7.4. Water temperature is measured at the point of use or inlet to the equipment. Water shall be permitted to be stored at higher temperatures.

b. Hot water distribution systems serving patient care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet.

*c. Provisions shall be included in the domestic hot water system to limit the amount of *Legionella* bacteria and opportunistic waterborne pathogens.

11.31.E4. The following standards shall apply to dDrainage systems. See Section 7.32.E4.:

a. Drain lines from sinks used for acid waste disposal shall be made of acid-resistant material.

b. Drain lines serving some types of automatic blood-cell counters must be of carefully selected material that will eliminate potential for undesirable chemical reactions (and/or explosions) between sodium azide wastes and copper, lead, brass, and solder, etc.

c. Insofar as possible, drainage piping shall not be installed within the ceiling or exposed in food preparation centers, food serving facilities, food storage areas, central services, electronic data processing areas, electric closets, and other sensitive areas. Where exposed, overhead drain piping in these areas is unavoidable, special provisions shall be made to protect the space below from leakage, condensation, or dust particles.

d. Floor drains shall not be installed in operating rooms.

e. Drain systems for autopsy tables shall be designed to positively avoid splatter or overflow onto floors or back siphonage and for easy cleaning and trap flushing.

f. Building sewers shall discharge into community sewerage. Where such a system is not available, the

~~facility shall treat its sewage in accordance with local and state regulations.~~

~~g. Kitchen grease traps shall be located and arranged to permit easy access without the need to enter food preparation or storage areas. Grease traps shall be of capacity required and shall be accessible from outside of the building without need to interrupt any services.~~

~~h. In dietary areas, floor drains and/or floor sinks shall be of type that can be easily cleaned by removal of cover. Provide floor drains or floor sinks at all "wet" equipment (as ice machines) and as required for wet cleaning of floors. Provide removable stainless steel mesh in addition to grilled drain cover to prevent entry of large particles of waste which might cause stoppages. Location of floor drains and floor sinks shall be coordinated to avoid conditions where locations of equipment make removal of covers for cleaning difficult.~~

11.31.E5. ~~The i~~Installation, testing, and certification of nonflammable medical gas and air systems ~~shall comply with the requirements of NFPA 99. (See Table 7.5 for rooms requiring station outlets.)~~. See Section 7.32.E5.

11.31.E6. Clinical vacuum systems. ~~installations shall be in accordance with NFPA 99. (See Table 7.5 for rooms requiring station outlets.)~~See Section 7.32.E6.

11.31.E7. ~~All~~ System piping~~, except control line tubing, shall be identified. All valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference~~. See Section 7.32.E7.

11.31.E8. ~~Provide c~~Condensate drainage. ~~s for cooling coils of type that may be cleaned as needed without disassembly. (Unless specifically required by local authorities, traps are not required for condensate drains.) Provide air gap where condensate drains empty into floor drains. Provide heater elements for condensate lines in freezer or other areas where freezing may be a problem.~~See Section 7.32.E10.

11.31.E9. ~~No p~~Plumbing in food preparation and storage areas. ~~lines may be exposed overhead or on walls where possible accumulation of dust or soil may create a cleaning problem or where leaks would create a potential for food contamination.~~See Section 7.32.E11.

11.32. Electrical Standards

11.32.A. General

11.32.A1. All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99 and shall be listed as complying with available standards of listing agencies or other similar established standards where such standards are required.

11.32.A2. The electrical installations, including alarm, nurse call, staff emergency signed system, and communication systems, shall be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment shall show compliance with applicable codes and standards.

11.32.A3. Data processing and/or automated laboratory or diagnostic equipment, if provided, may require

safeguards from power line disturbances.

11.32.B. Services and Switchboards
Main switchboards shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only. Switchboards shall be convenient for use, readily accessible for maintenance, away from traffic lanes, and located in dry, ventilated spaces free of corrosive or explosive fumes, gases, or any flammable material. Overload protective devices shall operate properly in ambient room temperatures.

11.32.C. Panelboards
Panelboards serving normal lighting and appliance circuits shall be located on the same floor as the circuits they serve. Panelboards serving critical branch emergency circuits shall be located on each floor that has major users. Panelboards serving Life Safety emergency circuits may also serve floors above and/or below.

11.32.D. Lighting

11.32.D1. Lighting shall be engineered to the specific application.

11.32.D2. The Illuminating Engineering Society of North America (IES) has developed recommended lighting levels for health care facilities. ~~The reader should r~~Refer to the IES publication ~~*IES Handbook* (1993)~~RP-29, *Lighting for Hospitals and Health Care Facilities*.

11.32.D3. Approaches to buildings and parking lots and all occupied spaces shall have lighting fixtures for ~~lighting~~ that can be illuminated as necessary.

11.32.D4. Patient rooms shall have general lighting and night lighting. At least one night~~-~~light fixture in each patient room shall be controlled at the room entrance.

11.32.D5. Nursing unit corridors shall have general illumination with provisions for reducing light levels at night.

11.32.D6. Consideration should be given to the special needs of the elderly. Excessive contrast in lighting levels that make effective sight adaptation difficult should be minimized. Refer to IES publication, RP-28, *Lighting and the Visual Environment for Senior Living*.

11.32.E. Receptacles (Convenience Outlets)

11.32.E1. Each patient room shall have duplex-grounded receptacles. There shall be one at each side of the head of each bed and one on every other wall. Receptacles may be omitted from exterior walls where construction or room configuration makes installation impractical. These outlets shall be tamper-resistant or equipped with ground-fault circuit interrupters (GFCIs).

11.32.E2. Duplex-grounded receptacles for general use shall be installed approximately 50 feet (15.24 meters) apart in all corridors and within 25 feet (7.62 meters) of corridor ends. These outlets shall be tamper-resistant or equipped with GFCIs.

11.32.E3. Electrical receptacle coverplates or electrical receptacles supplied from the emergency system shall be distinctively colored or marked for identification. If color is used for identification purposes, the

same color should be used throughout the facility.

11.32.F. Equipment

11.32.F1. Ground-fault circuit interrupters shall comply with NFPA 70. ~~When~~ Where GFCIs are used in critical areas, provisions shall be made to ~~i~~ensure that other essential equipment is not affected by activation of one interrupter.

11.32.F2. Special equipment is identified in the following sections: Nursing Units, Resident Support Areas, Rehabilitation Therapy, Laboratory, Pharmacy, and Imaging if applicable. These sections shall be consulted to ensure compatibility between programmatically define equipment needs and appropriate power and other electrical connection needs.

11.32.G. Nurse Calling System

11.32.G1. A nurse~~s~~ calling system is not required in psychiatric nursing units, but if it is included provisions shall be made for easy removal or ~~for~~ covering of call buttons. All hardware shall have tamper-resistant fasteners. Calls shall activate a visible signal in the corridor at the patient's door and at an annunciator panel at the nurse station or other appropriate location. In multicorridor nursing units, additional visible signals shall be installed at corridor intersections.

11.32.G2. The staff emergency call, if provided, shall be designed so that a signal activated by staff at a patient's calling station will initiate a visible and audible signal distinct from the regular nurse calling system. The signal shall activate an annunciator panel at the nurses' station or other appropriate location, a distinct visible signal in the corridor at the door to the room from which the signal was initiated, and at other areas defined by the functional program.

11.32.G3. Alternate technologies ~~can~~ may be considered for emergency or nurse call systems. If radio frequency systems are ~~utilized~~used, consideration should be given to electromagnetic compatibility between internal and external sources.

11.32.H. Emergency Electrical Service

11.32.H1. As a minimum, nursing facilities or sections thereof shall have emergency electrical systems as required in NFPA 101, NFPA 110, and NFPA 99.

11.32.H2. ~~When~~ Where the psychiatric facility is a distinct part of an acute-care hospital, it may use the emergency generator system for required emergency lighting and power, if such sharing does not reduce hospital services. Life support systems and their respective areas shall be subject to applicable standards of Section 7.32.

11.32.H3. An emergency electrical source shall provide lighting and/or power during an interruption of the normal electric supply.

11.32.I. Fire Alarm System
Fire alarm and detection systems shall be provided in compliance with NFPA 101 and NFPA 72.

11.32.J. Telecommunications and Information Systems

11.32.J1. Locations for terminating telecommunications and information system devices shall be provided.

11.32.J2. An area shall be provided for central equipment locations. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

11.32.K. Electronic Surveillance Systems

11.32.K1. Electronic surveillance systems are not required in psychiatric nursing units, but if provided for the safety of the residents, any devices in resident areas shall be mounted such that they are unobtrusive and in a tamper- resistant enclosure.

11.32.K2. Electronic surveillance system monitoring devices shall be located in such a location as not to be readily observable by the general public or other patients.

11.32.K3. Electronic surveillance systems, if installed, shall be supplied power from the emergency electrical system in the event of a disruption of normal electrical power.

12. MOBILE, TRANSPORTABLE, AND RELOCATABLE UNITS

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

12.1 General

12.1.A. Definitions

12.1.A1. Mobile unit: Any pre-manufactured structure, trailer, or self-propelled unit, equipped with a chassis on wheels and intended to provide shared medical services to the community on a temporary basis. These units are typically 8 feet wide by 48 feet long (2.44 meters by 14.63 meters) (or less), some equipped with expanding walls, and designed to be moved on a daily basis.

12.1.A2. Transportable unit: Any pre-manufactured structure or trailer, equipped with a chassis on wheels, intended to provide shared medical services to the community on an extended temporary basis. The units are typically 12 feet wide by 60 feet long (3.66 meters by 18.29 meters) (or less) and are designed to move periodically, depending on need.

12.1.A3. Relocatable unit: Any structure, not on wheels, built to be relocated at any time and provide medical services. These structures vary in size.

***12.1.B~~A~~. Application**
This section applies to mobile, transportable, and relocatable structures. The size of these units limits occupancy, thereby minimizing hazards and allowing for less stringent standards. Needed community services can therefore be provided at an affordable cost. These facilities shall be defined as space and equipment service for four or fewer workers at any one time. Meeting all provisions of Section 9.2 for general outpatient facilities is desirable, but limited size and resources may preclude satisfying any but the basic minimums described. When invasive procedures are performed in a mobile unit, all units shall be provided with handwashing stations. Specifically described are:

12.1.~~A~~B1. Mobile units.

12.1.B~~A~~2. Transportable units.

12.1.B~~A~~3. Relocatable units.

~~**12.1.B.** Definitions~~

~~**12.1.B1.** Mobile unit: Any pre-manufactured structure, trailer, or self-propelled unit, equipped with a chassis on wheels and intended to provide shared medical services to the community on a temporary basis. These units are typically 8 feet wide by 48 feet long (2.44 meters by 14.63 meters) (or less), some equipped with expanding walls, and designed to be moved on a daily basis.~~

~~**12.1.B2.** Transportable unit: Any pre-manufactured structure or trailer, equipped with a chassis on wheels, intended to provide shared medical services to the community on an extended temporary basis.~~

~~The units are typically 12 feet wide by 60 feet long (3.66 meters by 18.29 meters) (or less) and are designed to move periodically, depending on need.~~

~~**12.1.B3.** Relocatable unit: Any structure, not on wheels, built to be relocated at any time and provide medical services. These structures vary in size.~~

12.1.C. Occupancy Classification
The classifications of these facilities shall be Business Occupancy as listed in the building codes and NFPA 101 Life Safety Code.

~~Units shall comply with NFPA 101, where patients incapable of self-preservation or those receiving inhalation anesthesia are treated~~.

12.1.D. Common Elements ~~for Mobile, Transportable, and Relocatable Units~~

12.1.D1. Site conditions.

a. Access for the unit to arrive shall be taken into consideration for space planning. Turning radius of the vehicles, slopes of the approach (6 percent maximum), and existing conditions shall be addressed.

b. Gauss fields of various strengths of magnetic resonance imaging (MRI) units shall be considered for the environmental effect on the field homogeneity and vice versa. Radio frequency interference shall be considered when planning a site.

c. Sites shall be provided with properly sized power, including emergency power, water, waste, telephone, and fire alarm connections, as required by local and state building codes.

d. Sites shall have level concrete pads or piers and be designed for the structural loads of the facility. Construction of pads shall meet local, state, and seismic codes. Concrete-filled steel pipe bollards are recommended for protection of the facility and the unit.

e. Sites utilizing MRI systems shall consider providing adequate access for cryogen-servicing of the magnet. Cryogen dewars are of substantial weight and size. Storage of dewars also shall be included in space planning.

f. It is recommended that each site provide a covered walkway or enclosure to ensure patient safety from the outside elements.

g. Consideration shall be given to location of the unit so that diesel exhaust of the tractor and/or unit generator is kept away from the fresh air intake of the facility.

h. Each facility shall provide a means of preventing unit movement, either by blocking the wheels or by providing pad anchors.

i. Sites shall provide hazard-free drop-off zones and adequate parking for patients.

j. The facility shall provide waiting space for patient privacy and patient/staff toilets as close to the unit docking area as possible.

k. Each site shall provide access to the unit for wheelchair/stretcher patients~~ to the unit~~.

l. Mobile units ~~providing~~ where noninvasive procedures are performed shall be provided with handwashing stations unless each site can provide handwashing stations within ~~a~~ 25~~-~~ f~~oo~~eet (7.47 meters) ~~proximity to~~of the unit. Transportable and relocatable units shall be provided with handwashing stations.

m. It is recommended that each site requiring water and waste services to the unit provide a means of freeze protection in geographical areas where freezing temperatures occur.

12.1.D2. Site considerations—relocatable units. Seismic force resistance for relocatable units shall comply with Section 1.5 and shall be given an importance factor of one when applied to the seismic design formulas. These units shall meet the structural requirements of the local and state building codes.

12.1.E. General Standards for Details and Finishes for Unit Construction

12.1.E1. Existing facilities. Existing facilities shall comply with applicable requirements of the existing Business Occupancies, Chapter 27, of NFPA 101. ~~; and w~~Where ~~there are~~ patients incapable of self-preservation are receiving inhalation anesthesia, ~~existing Ambulatory Health Care Centers, Chapter 13-6~~Ambulatory Health Care Occupancy, Chapter 21 of NFPA 101, shall apply.

12.1.E2. Details and finishes. Requirements below apply to all units unless noted otherwise:

a. Horizontal sliding doors and power-operated doors shall comply with NFPA 101.

b. Units shall be permitted a single means of egress as permitted by NFPA 101.

c. All glazing in doors shall be safety or wire glass.

d. Stairs for mobile and transportable units shall be in accordance with the following table:

New units

Minimum width clear of all obstructions, except projections not exceeding 3-1/2 inches at or below handrail height on each side	34 inches (863.6 millimeters)
Minimum headroom	6 feet 8 inches (2.03 meters)
Maximum height of risers	9 inches (228.6 millimeters)

Minimum height of risers	4 inches (101.6 millimeters)
Minimum tread depth	9 inches (228.6 millimeters)
Doors opening immediately onto stairs without a landing	NO

Existing units

Minimum width clear of all obstructions, except projections not exceeding 3-1/2 inches at or below handrail height on each side	27 inches (.69 meter)
Minimum headroom	6 feet 8 inches (2.03 meters)
Maximum height of risers	9 inches (228.6 millimeters)
Minimum height of risers	4 inches (101.6 millimeters)
Minimum tread depth	7 inches (177.8 millimeters)
Doors opening immediately onto stairs without a landing	YES

There shall be no variation exceeding 3/16 inch in depth of adjacent treads or in the height of adjacent risers, and the tolerance between the largest and smallest tread shall not exceed 3/8 inch in any flight.

Exception: Where the bottom riser adjoins a public way, walk, or driveway having an established grade and serving as a landing, a variation in height of not more than 3 inches (76.2 millimeters) in every 3 feet (0.91 meter) and fraction of thereafter is permitted. Adjustable legs at the bottom of the stair assembly shall be permitted to allow for grade differences.

Stairs and landings for relocatable units shall comply with NFPA 101.

e. Handrails shall be provided on at least one side. Handrails shall be installed and constructed in accordance with NFPA 101, with the following exception: Provided the distance from grade to unit floor height is not greater than 4 feet 5 inches (1.35 meters), one intermediate handrail, having clear distance

between rails of 19 inches (0.48 meter) maximum, shall be permitted. Exception: Existing units having a floor height of 63 inches (1.60 meters) maximum.

f. Manual fire extinguishers shall be provided in accordance with NFPA 101.

g. Fire detection, alarm, and communications capabilities shall be installed and connected to facility central alarm system on all new units in accordance with NFPA 101.

h. Radiation protection for ~~X~~x-ray and gamma ray installations shall be in accordance with NCRP reports numbers 49 and 91 in addition to all applicable local and state requirements.

i. Interior finish materials shall be class A as defined in NFPA 101.

j. Textile materials having a napped, tufted, looped, woven, nonwoven, or similar surface shall be permitted on walls and ceilings provided such materials have a class "A" rating *and* rooms or areas are protected by automatic extinguishment or sprinkler system.

k. Fire--retardant coatings shall be permitted in accordance with NFPA 101.

l. Curtains and draperies shall be non-combustible or flame retardant and shall pass both the large- and small--scale tests required by NFPA 101.

12.1.F. Environmental Standards
All mobile, transportable, and relocatable units shall be sited in full compliance with such federal, state, and local environmental laws and regulations as may apply, for example, those listed in Section 3.3.

12.2-12.30 Reserved

12.31. Mechanical Standards

12.31.A.
Air conditioning, heating, ventilating, ductwork, and related equipment shall be installed in accordance with NFPA 90B, *Standard for the Installation of Warm Air Heating and Air Conditioning Systems.*

12.31.B.
All other requirements for heating and ventilation systems shall comply with Sections 9.31.A through 9.31.D.

12.31.C. Plumbing Standards

12.31.C1. Plumbing and other piping systems shall be installed in accordance with applicable model plumbing codes, unless specified herein.

12.31.C2. Mobile units~~,~~ requiring sinks~~,~~ shall not be required to be vented through the roof. ~~Ventilation of w~~Waste lines shall be permitted to be vented through the sidewalls or other acceptable locations. Transportable and relocatable units shall be vented through the roof per model plumbing codes.

12.31.C3. All waste lines shall be designed and constructed to discharge into the facility sanitary sewage system.

12.31.C4. Backflow prevention shall be installed at the point of water connection on the unit.

12.31.C5. Medical gases and suction systems, if installed, shall be in accordance with NFPA 99.

12.32. Electrical Standards

12.32.A. General

12.32.A1. All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99 and shall be listed as complying with available standards of listing agencies or other similar established standards where such standards are required.

12.32.A2. The electrical installations, including alarm, nurse call, and communication systems, shall be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment shall show compliance with applicable codes and standards.

12.32.A3. Data processing and/or automated laboratory or diagnostic equipment, if provided, may require safeguards from power line disturbances.

12.32.B. Services and Switchboards

Main switchboards shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only. Switchboards shall be convenient for use, readily accessible for maintenance, away from traffic lanes, and located in dry, ventilated spaces free of corrosive or explosive fumes, gases, or any flammable material. Overload protective devices shall operate properly in ambient room temperatures.

12.32.C. Panelboards

Panelboards serving normal lighting and appliance circuits shall be located on the same level as the circuits they serve.

12.32.D. Lighting

12.32.D1. Lighting shall be engineered to the specific application.

12.32.D2. The Illuminating Engineering Society of North America (IES) has developed recommended lighting levels for health care facilities. ~~The reader should r~~Refer to~~ the *IES Handbook* (1993)~~ IES publication RP-29, *Lighting for Hospitals and Health Care Facilities*.

12.32.D3. Approaches to buildings and parking lots and all occupied spaces shall have lighting fixtures ~~for lighting~~ that can be illuminated as necessary.

12.32.D4. Consideration should be given to the special needs of the elderly. Excessive contrast in lighting levels that make effective sight adaptation difficult should be minimized. Refer to IES publication, RP-28, *Lighting and the Visual Environment for Senior Living*.

12.32.D5. A portable or fixed examination light shall be provided for examination, treatment, and trauma rooms.

12.32.E. Receptacles (Convenience Outlets)
Duplex grounded-type receptacles (convenience outlets) shall be installed in all areas in sufficient quantities for tasks to be performed as needed. Each examination and work table shall have access to a minimum of two duplex receptacles.

12.32.F. Equipment

12.32.F1. At inhalation anesthetizing locations, all electrical equipment and devices, receptacles, and wiring shall comply with applicable sections of NFPA 99 and NFPA 70.

12.32.F2. Fixed and mobile ~~X~~x-ray equipment installations shall conform to articles 517 and 660 of NFPA 70.

12.32.G. Reserved

12.32.H. Emergency Electrical Service
Emergency lighting and power shall be provided for in accordance with NFPA 99, NFPA 101, and NFPA 110.

12.32.I. Fire Alarm System
The fire alarm system shall be as described in NFPA 101 and, where applicable, NFPA 72.

12.32.J. Telecommunications and Information Systems

12.32.J1. Locations for terminating telecommunications and information system devices shall be located on the unit that the devices serve and shall be accessible to authorized personnel only.

12.32.J2. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

A12.1.A

When invasive procedures are performed in mobile, relocatable, or transportable units, the standard of care and the environment of care should be at least as safe as a hospital or outpatient facility performing similar procedures.

*13. HOSPICE CARE

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

Hospice care, a proven, effective, and compassionate service, helps the terminally ill patient through the dying process with dignity and in comfort. Hospice care also helps the family through its loss and bereavement. Hospice can offer terminally ill individuals the option of spending their final weeks and months in their own home. The process of dying is never an easy one, but the final days can be comforting for all involved. Ninety-five percent of patients die at home. And the need for services does not end with death; bereavement counseling is available to family members for a year after the death of a loved one.

Hospice typically has a philosophy that is distinct from other types of care.

A hospice unit (suite) may be set up in an acute setting or it may be a freestanding building. In either situation, the focus should be on a residential environment in terms of furnishings, accessories, and other design features. Hospice is a medically directed, interdisciplinary program of palliative services for terminally ill people and their families. Hospice emphasizes pain and symptom control provided by a team of professionals that includes physicians, nurses, social workers, chaplains, and volunteers as well as others as needed by the family or patient. Hospice is primarily a concept of care rather than a specific place. The majority of hospice services are delivered in the home or a homelike setting with inpatient care available as needed.

A13. Hospice Care

This text is placed in the appendix to solicit public comment:

To improve the quality of life for terminally ill individuals, their caregivers, families, and loved ones, hospices are becoming increasingly important alternative environments and/or alternative care systems. Hospice facilities are being developed in acute care hospitals, as part of nursing facilities, and as freestanding facilities, with little available guidance as to which functional elements and environmental features are necessary and appropriate. Available books and publications address the rationales and philosophies that motivate hospice care providers. However, no research based guidelines for hospice design and/or construction currently exist.

Many hospice facilities built to date have been renovations of parts of existing hospital or nursing care facilities. As such, they are too full of compromise to serve as adequate guides to the future of hospice design.

Hospice design should take into consideration the needs of both the resident and the resident's family. It should allow for private interaction within the family and provide areas where families can gain strength by interacting with each other. Ministrations to families are of great importance in hospices. Family members are usually present in greater numbers and for longer periods than those visiting in acute hospitals; some facilities report that overnight stays by relatives are common. Small residential units with living room type lounges and small dining areas and kitchen facilities are helpful. Staff areas should be unobtrusive and yet be capable of accommodating the needs of nursing staff and the various disciplines involved in care of these residents, which may include social workers, dietitians, and clergy, as well as physicians. Clinical

care, while palliative, may still involve intense nursing as these residents become progressively more dependent.

A hospice philosophy may include the following:

? Death is seen as a normal part of life.

? Awareness of death can lead to physical, emotional, social, or spiritual needs.

? Society addresses these needs in the hospital, nursing facility, assisted living, and group home models.

In the hospice facility there is a focus on relief of pain and discomfort. Pain medications and other drugs made necessary by illness may be administered in various forms and are at the heart of hospice resident care. No surgical techniques are used and a physician visits on a scheduled basis or in response to an emergency. In the institutional atmosphere, the technologies should be minimized and a homelike environment should be provided.

Design Considerations for Hospice Environments

Private bedrooms work well for patients whose symptoms are particularly distressing or when the patient has family living at the bedside.

Patients/residents should have a pleasant view and, if at all possible, be able to go outside directly from the room.

A homelike setting is desirable and should include the following:

? A place where all family members, including children, feel free to come and go in a very natural, family-like manner.

? Social areas where family members feel free to bring food and dine together and where they can enjoy music, games, and other activities common to the family unit.

? A place for social activities, where children are welcome and plants are important.

? A balance between privacy and opportunities for social interaction.

The resident areas, such as bedrooms, dining areas, lounges, and surroundings, should be designed to promote privacy and dignity for the resident and family. The interior design of resident use areas should consider lighting, the use of finish materials, furniture arrangement, and equipment to create a residential ambience without compromising the ability of caregivers to attend to the needs of the resident. Resident toilet rooms should be accessible and provide adequate space for staff assistance in wheelchair transfers as necessary.

Resident Rooms

The maximum number of residents in a bedroom should be based on the functional program. Each resident

~~bedroom should~~

~~? Be located at or above grade level.~~
~~? Have provisions to ensure visual privacy for treatment or visiting.~~

~~Artificial lighting should be provided sufficient for treatment and nontreatment needs.~~

~~Each resident room should have a window that can be opened without the use of tools. The windowsills should not be higher than 2 feet, 8 inches (762 millimeters) above the floor and should be above grade. Windows with operable sash should be provided with insect screens. Window openings should be designed to prevent accidental falls when open.~~

~~Each resident room should have convenient access to a toilet room . One toilet room should serve no more than two residents. The accessible toilet room should contain a water closet and a sink.~~

~~The toilet room should be furnished with the following:~~

~~? Grab bars~~

~~? Lavatory with single lever or wrist blade-type faucets~~

~~? Mirror~~

~~? Soap, paper towel dispensers, and wastepaper receptacle with a removable impervious liner~~

~~A bathing facility containing either a bathtub or a shower accessible to a wheeled shower chair should be conveniently accessible to resident rooms. An accessible toilet room should be accessible to the bathing room. Bathing "spas," with circulating warm water, are recommended.~~

~~As required by the functional program, the following should be provided:~~

~~? Charting facilities~~

~~? Storage for supplies; resident care equipment; housekeeping equipment; and cleaning supplies~~

~~? Locked medication storage and storage for drugs requiring refrigeration~~

~~? A comfortable and easily accessible sleep area for family members~~

~~A residential kitchen with the cooking unit vented to the outside should be provided.~~

~~Provide dining and/or gathering space for residents and families as required by the functional program.~~

~~Other requirements should include an audible and accessible call system furnished in each resident's room and bathroom, connected to the staff station.~~

~~There should be a visitors'/staff toilet room located near resident and gathering areas.~~

~~Housekeeping~~
~~Housekeeping space should be provided convenient to the resident and service areas.~~

~~Clean Linen and Supply~~
~~A space sized to store clean linen and supplies, as required by the functional program, should be provided.~~

~~Soiled Utility Room~~
~~A soiled utility or work room should be provided in accordance with the functional program.~~

~~Stretcher and wheelchair storage should be provided~~

~~Office space should be provided for persons with administrative responsibilities.~~

~~Furnishings and Finishes~~

~~Handrails should be provided on both sides of all corridors used by patients.~~

~~For each nursing unit or fraction thereof on each floor, the following should be provided: a nourishment station with work space, cabinet, refrigerated storage, and a small stove or hot plate.~~

~~Staff work areas in direct care locations should have space for charting, storage, and administrative activities. Depending upon the type of service and care plan to be provided, direct care staff work areas may be accommodated at a piece of residential furniture (such as a table or desk) or at a work counter recessed into an alcove off a corridor or activity space, with computer and communications equipment, storage facilities, etc.~~

13.1 General Conditions

Hospice care is a medically directed, interdisciplinary program of palliative services for terminally ill individuals and their family members or significant others.

13.1.A. Applicability

Hospice care supports terminally ill persons through the dying process with dignity and in comfort. Hospice is a medically directed, interdisciplinary program emphasizing pain management, symptom control and palliative services provided by a team of professionals that may include nursing staff, social workers, dietitians, volunteers and clergy, as well as physicians who may visit on a scheduled basis or in response to an emergency. No surgical techniques are used. In-patient hospices are part of a continuum of palliative care. They have been developed as new facilities and through renovations.

This chapter covers hospice services, which may be provided in a freestanding facility; represents *minimum* requirements for new construction; and shall not be applied to existing facilities unless major construction renovations (see Section 1.3A) are undertaken. Hospices are typically licensed as either residential or in-patient care facilities. Chapter 13 addresses inpatient freestanding hospices. At the discretion of the authority having jurisdiction, the design concepts presented herein may be applied to hospice programs located in other health care facilities.

13.1.B Ancillary Services
See Sections 8.1.B.

13.1.C Environment of Care
See Section 8.1.C.

13-1-D-13.1.N.
Refer to sections 8.1.D-8.1.N.

13.2 Hospice Facility
Each facility shall comply with the following:

13.2.A. Care Unit Size and Configuration
In the absence of local requirements, consideration shall be given to restricting the size of the care unit to 25 beds.

13.2.B. Patient Rooms
Each patient room shall meet the following requirements:

13.2.B1. Maximum room occupancy shall be one resident unless justified by the functional program. In no case shall bedrooms exceed two occupants. See Section 8.2.B.

Room size shall be based on program of care, distinctive in-room furniture, and clothing storage. If consistent with the functional program, accommodation for dining shall be provided in the resident room.

Access shall be provided to both sides of the resident bed.

13.2.B3. See Section 8.2.B3.

13.2.B4. See Section 8.2.B4.

13.2.B5–13.2.B7. See sections 8.2.B5–8.2.B7.

13.2.B8. Airborne infection isolation room(s). The need for and number of required airborne infection isolation room(s) shall be determined by an infection control risk assessment. Where required, the airborne infection isolation room(s) shall comply with the general requirements of Section 7.2.C.

13.2.C. Service Areas.
See 8.2.C.

13.3 Patient Support Areas

See 8.3.A and 8.3.B.

13.4 Activities

See 8.4.A and 8.4.B.

13.5 Therapy

See 8.5.

13.6 Personal Services (Barber/Beauty) Areas

If these services are required by the functional program, see 8.6.

13.7 Safety

See 8.8.A.

13.7.A1. Doors. See 8.8.A1.

13.7.A2 Windows. See 8.8.A2.

13.8 Outdoor Spaces

Secure outdoor areas shall be available for residents.

13.9 Dietary Facilities

The following facilities shall be provided:

13.9.A. Dining Facilities
If food preparation is provided on site, the facility shall dedicate space and equipment for the preparation of meals. Food service physical environment and equipment shall comply with the locally adopted food and sanitary regulations. Where locally allowed, residential "home-like" kitchen facilities shall be permitted.

Provision shall be made for transport of hot and cold foods, as required by the functional program. Separate dining areas shall be provided for staff and patients. The design and location of dining facilities shall encourage patient use.

13.9.B. Ice-Making Facilities
Ice-making facilities shall be self-dispensing if available for use by patients and/or visitors. Ice-making facilities under the control of the dietary staff and not available for use by patients and/or visitors may be bin type or self-dispensing. These may be located in the food preparation area or in a separate room, and shall be easily cleanable and convenient to the dietary function.

13.14.A2. See 8.14.A2.

13.14.A7. See 8.14.A7.

13.31 Mechanical Standards. See 8.31.

13.32 Electrical Standards. See 8.32.

*14. ASSISTED LIVING

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

~~*A14. ASSISTED LIVING~~

~~Assisted living residences are an important concept in the continuum of care. They encompass a wide spectrum of provider models. The design should accommodate residents with a range of cognitive and physical abilities. Flexibility and innovation in facility design are encouraged in this evolving field.~~

~~An assisted living setting should be designed in a way that maximizes the quality of life, independence, autonomy, safety, dignity, choice, and privacy of residents. Settings should also be designed in a manner that promotes family and community involvement. In accordance with program parameters, facility design should allow residents to interact freely with others in the assisted living residence and with others in the community.~~

~~Readers interested in design, construction, and environmental issues related to assisted living are referred to the following organizations:~~

~~Your state's licensing authority~~
~~AAHSA American Association of Homes and Services for the Aging (www.aahsa.org)~~
~~AARP (www.aarp.org)~~
~~AHCA-NCAL National Center for Assisted Living of the American Health Care Association (www.ncal.org)~~
~~ALFA Assisted Living Federation of America (www.alfa.org)~~
~~Alzheimer's Association (www.alz.org)~~
~~ASHA American Seniors Housing Association (www.seniorshousing.org)~~
~~ICC International Code Council (www.icbo.org)~~
~~NASHP National Academy for State Health Policy (www.nashp.org)~~
~~NFPA National Fire Protection Association (www.nfpa.org)~~

*14.1 General Considerations

For the purposes of this chapter, assisted living facilities are a vital and growing component of the continuum of care, providing a supportive residentia1 environment for consumer-directed services. This chapter acknowledges that the many resident-driven variations of assisted living facilities that can be found represent the programmatic needs and preferences of the individuals who choose to live there. The requirements and recommendations contained herein therefore, are intended to represent the base-level standards that will ensure the safety, accessibility, and residential aspects of all assisted living facilities.

14.1.A. Applicability

This chapter identifies the minimum requirements for assisted living facilities and recognizes various configurations of assisted living facilities, which must comply with applicable state and local requirements. Acknowledging that occupancy and building construction requirements will vary among jurisdictions, it is the intent of this chapter to establish minimal standards for safety and accessibility for a residential care

environment, regardless of facility scope and scale. The common goal of this chapter and individual local and state requirements is to facilitate accountability as well as protection of the consumer.

14.1.B. Ancillary Services

When a facility shares or purchases services, appropriate modifications or deletions in space and parking requirements may be required.

14.1.C. Environment of Care

Assisted living facilities shall be designed and constructed to provide a supportive environment, conducive to the day-to-day activities of typical family life consistent with applicable cultural, emotional, and spiritual needs of individuals who need limited assistance. This supportive environment shall promote independence and dignity, balance autonomy with safety, and provide choice for all residents in a manner that encourages family and community involvement. The architectural environment shall eliminate as many barriers as possible to effective access and use of the space, services, equipment and utilities appropriate for daily living. See Chapter XX of this document for other general requirements.

14.1.D. Location

Assisted living facilities shall obtain applicable land use approval from the relevant jurisdiction. See Chapter 3 of this document for other general requirements.

14.1.E. Roads

Roads shall be provided within the property for access to the main entrance and service areas. Fire department and emergency vehicle access shall be provided in accordance with local requirements. See Chapter 3 of this document for other general requirements.

14.1.F. Parking

Each assisted living facility shall have parking space to satisfy the needs of the residents, families, staff, and visitors. In the absence of local requirements or a formal parking study, a minimum of one space for every four resident units (or beds) shall be provided. See Chapter 3 of this document for other general requirements.

14.1.G. Functional Program

The sponsor of each project shall provide a functional program, which defines the scope and scale of the facility, facilitates authorities having jurisdiction in the application of licensure and occupancy approvals, and addresses applicability provisions of this chapter. See section 1.1.F of this document for additional information.

14.1.H. Services

Assisted living facilities are unique in that services provided are in large part driven by the service needs and lifestyle preferences of the residents being served. The architectural environment shall support these services and levels of care provided within the facility. Services such as home health, hospice, dietary, storage, pharmacy, linen, and laundry in accordance with the functional program may be contractually provided or shared insofar as practical with other licensed or unlicensed entities.

14.1.I. Renovation

See Chapter 1 of this document for other issues to consider.

14.1.J. Provisions for Disasters
See Chapter 1 of this document for other issues to consider.

***14.1.K. Codes and Standards**
A code-compliant, safe, and accessible environment shall be provided. Other design and construction standards may apply when a facility seeks accreditation, certification, licensure, or other credentials When institutional codes are required, the facility shall maintain the residential environment desired by residents.

14.1.K1. Accessibility codes. The facility shall comply with applicable federal, state, and local requirements (see Section 1.4).

14.1.L. Equipment
Assisted living facilities shall be equipped and furnished with facility and occupant items in accordance with the functional program. See Chapter 4 of this document for other issues to consider.

14.1.M. Construction
See Chapter 5 of this document for other issues to consider.

14.1.N. Record Drawings and Manuals
See Chapter 6 of this document for other requirements.

14.2 Resident Living Environment

***14.2A. Size and Configuration**
14.2.A1. Facility spatial requirements shall be determined by the functional program.

14.2.A2. Areas for the care and treatment of users not residing in the facility shall not interfere with or infringe upon the space of residents living in the facility.

14.2.B. Resident Accommodations

The facility shall provide adequately sized bedrooms or apartments (dwelling units) that allow for sleeping, afford privacy, provide access to furniture and belongings, and accommodate the care and treatment provided to the resident.

***14.2.B1.** Resident room size (area and dimensions) shall permit resident(s) to move with assistance of a walker or wheelchair about the room, allowing access to at least one side of a bed, window, closet or wardrobe, chair, dresser, and night stand.

a. Room size and configuration shall permit resident(s) options for bed location(s) and shall comply with spatial requirements of the authority having jurisdiction.

b. Bedrooms shall be limited to single or double occupancy.

c. Where cooking is permitted in resident rooms (apartment), additional floor area shall be provided for

cooking and dining. The cooking area shall be equipped with a dedicated sink, and cooking and refrigeration appliances.

14.2.B2. Bedrooms shall not be used as a passageway, corridor, or access to other bedrooms.

14.2.B3. Resident bedrooms shall have a window that provides natural light with a maximum sill height of 36 inches (0.91 meter) above the finished floor.

14.2.B4. Each resident shall be provided separate and adequate enclosed storage volume within the resident room.

***14.2.B5.** Each resident shall have access to a toilet room. A minimum of one toilet room shall be provided for every four residents not otherwise served by toilet rooms adjoining resident rooms. The toilet room shall contain a water closet, lavatory, and a horizontal surface for the personal effects of each resident.

14.2.B6. One bathtub or shower shall be provided for every eight residents (or fraction thereof) not otherwise served by bathing facilities in resident rooms. Bathing facilities shall be provided on each floor where resident sleeping areas are located.

a. A bathtub shall be provided for resident use when required by the functional program.

b. Bathing fixtures shall be located in individual rooms or enclosures, with space for private use of the bathing fixture, for drying and dressing, with convenient access to a grooming location containing a lavatory, mirror, and counter or shelf. A toilet shall be provided within or directly accessible to each resident bathing facility without requiring entry into the general corridor.

14.2.C. Service Areas

14.2.C1. Staff work area(s) shall be provided in accordance with the functional program.

a. Lockable storage shall be provided for resident records.

b. Direct visualization of resident rooms or corridors from staff work areas is not required.

14.2.C2. Toilet room(s) for staff and public use shall be provided, and shall contain water closets with a handwashing station. Toilet rooms may be unisex, and shared by public and residents.

14.2.C3. Lockable closets, drawers, or compartments shall be provided for safekeeping of staff personal effects such as handbags.

14.2.C4. Staff lounge area shall be provided when required by the functional program.

14.2.C5. When required by the functional program, provision shall be made for 24-hour distribution of medications. A medicine preparation room, a self-contained medicine dispensing unit, or other system may be used for this purpose. The medicine preparation room, if used, shall provide for security. It shall contain

a work counter, sink, refrigerator, and locked storage for controlled drugs. A self-contained medicine dispensing unit, if used, may be located at the staff work area, in the clean workroom, in an alcove, or in other space convenient for staff control. (Standard "cup" sinks provided in many self-contained units are not adequate for handwashing.)

14.3. Resident Support Areas

14.3.A. Dining Areas

14.3.A1. Space for dining, separate from social areas, shall be provided.

14.3.A2. In a facility with more than 16 residents, dining and social areas shall not be confined to a single room.

14.3.A3. Natural light shall be provided at resident dining areas.

14.3.A4. Dining areas shall be configured in accordance with the functional program.

14.3.A5. Dining areas shall provide 20 square feet (6.09 square meters) per occupant using the space at one time.

14.3.A6. Toilet room(s) shall be provided convenient to dining and social areas.

14.3.B. Storage

The facility shall provide storage space for equipment and supplies required for the care of residents as required by the functional program.

14.4 Activities and Social Areas

Activity areas shall accommodate both group and individual activities.

14.4.A. A minimum of 20 square feet (6.09 square meters) per facility resident shall be provided for activity areas for socialization, passive and active recreation, and social activities.

***14.4.B.** Outdoor areas for shall be provided for residents, visitors, and staff. Outdoor spaces may include gardens on grade or on roof decks, or solaria, porches, and balconies.

14.4.C. Toilet room(s) shall be provided convenient to activity areas.

14.5–14.7. Reserved.

***14.8 Alzheimer's and Other Dementia Units**

A secure unit is a distinct living environment designed for the particular needs and behaviors of residents with dementia. Dementia units within assisted living facilities shall, in addition to the assisted living

requirements, comply with the following:

14.8.A. A dementia unit operated as a portion of an assisted living facility must provide self-contained leisure and dining room space, unless it can be demonstrated to the satisfaction of the authority having jurisdiction that use of shared common areas is appropriate to the needs of all residents.

14.8.B. For operational efficiency, support services and spaces may be located within adjacent programs.

14.8.C. Dementia units shall provide an appropriate controlled-egress system on all required exit doors or those leading to other areas of the facility, unless prior approval of an alternative method for the prevention of resident elopement from the unit has been obtained from the authority having jurisdiction.

14.8.D. All operable windows shall be equipped with mechanisms to limit exterior window openings, to prevent elopement and prevent accidental falls.

14.8.E. Alternative toilet and bathing fixture ratios shall be allowed in accordance with the functional program.

14.9 Dietary Facilities

The food preparation and service area shall be provided with sufficient and suitable space and equipment to maintain efficient and sanitary operation of all required functions, in compliance with the applicable state and local sanitary codes.

14.10 Administration and Public Areas

14.10.A. Areas shall be provided suitable for posting required notices, documents, and other written materials in public locations visible to and accessible to residents, staff, and visitors.

14.10.B. Private space shall be provided for residents to meet with others.

14.11 Linen Services

Space shall be provided for laundry services, as defined by the functional program.

14.11.A. If contractual services are used, the facility shall provide an area for soiled linen awaiting pickup and a separate area for storage and distribution of clean linen.

14.11.B. If on-site services are provided, the facility shall have areas dedicated to laundry and separate from food preparation areas. The facility laundry area for facility-processed bulk laundry shall be divided into separate soiled (sort and washer area) and clean (drying, folding and mending area) rooms. Separate soaking and handwashing sinks and housekeeping room shall be conveniently located to laundry areas.

14.11.C. If shared personal laundry areas are provided, the areas shall be equipped with a washer and dryer for use by residents and a conveniently located handwashing station.

14.12 Housekeeping

Space shall be provided for storage of housekeeping supplies and equipment. A designated service sink shall be provided.

14.13 Engineering Service and Equipment Areas

Assisted living facilities shall provide the necessary area to effectively house building systems and maintenance functions in accordance with the functional program. See chapter XX for common elements.

14.14–14.27. Reserved.

14.28 General Standards for Details and Finishes

Assisted living facilities shall incorporate features and finishes that optimize sensory function and facilitate mobility, including ambulation and self-propulsion, including the incorporation of features that optimize independent way-finding. Potential hazards to residents, including sharp corners, slippery floors, loose carpets, and exposed hot surfaces, shall be avoided.

14.29 Construction Features

See chapter XX for common elements.

14.30 Special Systems

14.30.A. (reserved)

14.30.B. Vertical Transportation and Elevators

Multistory assisted living facilities shall be provided with independent access to all resident use floors.

14.30.C. Waste Storage and Processing Service

Accommodations shall be made for the collection and disposal of waste produced within the facility. Space shall be provided for enclosed waste storage that is separate from food preparation, personal hygiene, and other clean functions. See chapter XX for common elements.

14.31 Mechanical Standards

14.31.A. General

Assisted living facilities shall have building systems that are designed and installed in such a manner as to provide for the safety, comfort, and well-being of the residents. See chapter XX for common elements.

14.31.B. Reserved.

14.31.C. Reserved.

14.31.D. Heating, Ventilation, and Air Conditioning Systems

Assisted living facilities shall have an HVAC system(s) to prevent the concentrations of contaminants and temperatures that impair health or cause discomfort to residents and employees. Airflow shall move from generally from clean to soiled locations. See chapter XX for common elements.

14.31.D1. The facility shall have a permanently installed heating system capable of maintaining an interior temperature of 72 degrees Fahrenheit (22 degrees Celsius) under heating design temperatures.

14.31.D2. The facility shall be configured and equipped with a cooling system capable of maintaining an interior temperature of 75 degrees Fahrenheit (24 degrees Celsius) under cooling design temperatures.

14.31.E. Plumbing and other piping systems shall comply with applicable codes and regulations. See chapter XX for common elements.

14.32 Electrical Standards

Lighting shall be engineered to the specific applic ation. Unless alternative lighting levels are justified by the approved functional program, Table 8.4 shall be used as a guide to minimum required ambient and task lighting levels in all rooms, spaces and exterior walkways.

***14.32.A.** The Illuminating Engineering Society of North America (IESNA) has developed recommended lighting design practices, including minimum lighting levels for senior living environments.

***14.32.B.** Approaches to buildings and parking lots, and all occupied spaces within buildings, shall have fixtures for lighting. Consideration shall be given to both the quantity and quality of lighting, including contrast in lighting levels, glare control, the special lighting needs of the elderly, area-specific lighting solutions, the use of daylighting, the life cycle costs of lighting, and other lighting design practices as defined and described in ANSI/IESNA RP-28-01.

14.32.C. Resident rooms and toilet rooms shall have provisions for general lighting and task lighting. All light controls in resident areas shall be quiet-operating.

14.32.D. Resident unit corridors shall have general illumination with provisions for reducing light levels at night. Corridors and common areas used by residents shall have even light distribution to avoid glare, shadows and scalloped lighting effects. Highly reflective floors shall be avoided.

14.32.E-14.32. Reserved.

***14.32.G Call System**

14.32.H Emergency Electrical Service
Emergency power provisions shall be provided for life support equipment.

14.32.I Fire Alarm System
Fire alarm and detection systems shall be provided in accordance with applicable codes and regulations. See chapter XX for common elements.

14.32.J Telecommunication and Information Systems

Telecommunication and information systems shall be provided in accordance with the functional program. See chapter XX for common elements.

A14.1. Assisted living facilities can be very different from one state to another and within each state. In some states, the building itself is not licensed. The entity that provides services is the licensed entity. The design of assisted living facilities varies, taking into consideration cultural, geographic, socioeconomic, and ethnic differences.

Assisted living facilities provide care for individuals who need or desire assistance with medications and activities of daily living (e.g. eating, bathing, dressing, toileting, and ambulating). Some facilities care only for people requiring minimal assistance with activities of daily living, while others may offer more intensive services, including dementia-specific care. The design and construction of assisted living facilities, as much as possible, shall reflect the needs and preferences of the individuals who reside in the facility.

A14.1.K There has been a great deal of discussion as to the appropriate Building Code or Life Safety Code under which assisted living facilities should be designed and constructed. Facilities serving similar resident groups and providing similar services are considered residential occupancies in some jurisdictions and institutional occupancies in others. The model codes do not adequately recognize the unique nature of assisted living as a distinct occupancy classification.

Institutional codes place overly restrictive and costly requirements on facility construction. Residential codes, however, may not require adequate protection.

To provide the flexibility needed to serve residents whose physical and mental capabilities may change over time; to eliminate the requirement for jurisdictions having authority to continually monitor the evacuation capabilities of residents within assisted living facilities; and to provide additional protection for facilities occupied by physically and mentally frail occupants who may require physical assistance from others, it is recommended that a "Residential Plus" construction type for assisted living facilities with 24-hour staff be utilized. A "Residential Plus" occupancy allows construction of facilities using residential construction, with the addition of several technological and institutional requirements. These additional requirements provide for prompt detection, notification, and suppression of fire within a facility and allow use of a "defend in place" approach that minimizes the need for evacuation of occupants.

Assisted living facilities utilizing residential occupancy and construction types should be allowed with the following additional safety features:

a. Facilities are protected throughout by a supervised automatic fire suppression system with quick response sprinklers within smoke compartments containing sleeping rooms. Automatic fire suppression systems in facilities with more than 16 occupants should be installed in accordance with NFPA 13.

b. Smoke barriers subdividing every story into at least two smoke compartments are provided. Such smoke compartments should be not more than 22,500 square feet (6,858 square meters) and with a travel distance from any point in each smoke compartment to a smoke barrier door not to exceed 200 feet (60.96 meters).

The therapeutic and programmatic benefits of providing waiting areas and similar spaces open to the corridor have long been recognized within long-term care facilities. Spaces open to the corridor significantly enhance resident mobility and accessibility to programs, encouraging resident participation.

Spaces open to corridors should be allowed within assisted living facilities utilizing residential occupancy and construction types where the following criteria are met:

a. The spaces are not used as sleeping rooms, or hazardous or incidental use areas, and the space is arranged so as not to obstruct access to required exits.

b. The corridors and areas open to corridors are equipped with quick response sprinklers and an automatic smoke detection system, which automatically notifies emergency forces.

Programmatic considerations may call for the control of egress from some facilities or portions of facilities. In the case such egress control is desired, the following should be followed:

a. The means of egress should not be locked except when clinical reasons are well documented and when such egress control is not a substitute for appropriate staffing.

b. When the means of egress is locked, a keyed or electronically released locking device must automatically open upon activation of the fire alarm system or lost of power.

c. No device operation sign should be posted when 24-hour awake and trained staff supervises the locking device.

A14.1.K1. Assisted living facilities should consider residents with varying and possibly increasing levels of acuity. To maximize the potential for aging in place, particular attention should be paid to overall accessibility. Locations where individuals may not require physical assistance from others in emergency situations typically require compliance with standards for multifamily housing (a specific subset is now used as "safe harbor" for Fair Housing architectural requirements). In addition, the Uniform Federal Accessibility Guidelines shall apply for structures built with federal assistance. Locations where individuals require physical assistance from others in emergency situations may require compliance with the Americans with Disabilities Act Accessibility Guidelines.

A14.2A. Assisted living has developed into a variety of models that are designed to meet differing social, economic, and therapeutic considerations. The many varieties of assisted living may generally be categorized into the following two types:

a. Apartment model facilities provide private resident units ranging in size from efficiency to two- or even three-bedroom apartments. These apartments are typically provided with cooking facilities (sometimes limited to a microwave) and are often indistinguishable from apartment units available to the general population. Common, group activity areas that residents may utilize in addition to their private apartment are provided to promote the social and programmatic aspects of the facility.

b. Group living model facilities provide smaller private spaces that are sometimes limited to a private or shared resident bedroom area. The focus of daily life is provided within shared activity spaces that are residential-scaled and organized similar to a typical house. These smaller-scale "homes" may be freestanding or grouped together in attached or detached configurations. At times, commons or community facilities are provided to allow residents to participate in activities outside of their "home."

Many alternative facility configurations have been created that incorporate aspects from each of these approaches. These guidelines are intended to allow and encourage the continued evolution of this facility type without locking into a particular program or model.

A14.2.B1. In cases where double-occupancy resident rooms are provided, configurations should be utilized that provide individual privacy and control of the environment. The design should not restrict access to shared, common elements within the room.

A14.2.B5. Doors to toilet rooms may be hinged, or where local requirements permit, sliding, pocket, or folding doors may be used for toilet rooms in resident rooms provided adequate provisions are made for acoustic and visual privacy and resident safety and usability. Toilets used by residents should be provided sufficient clearance on both sides of the water closet to enable physical access and maneuvering by staff, who may need to assist the resident in wheelchair-to-water closet transfers and returns. Where independent transfers are feasible, alternative grab bar configurations should be permitted.

A14.8. These are purpose-designed, secure units for individuals with dementia. Additionally, in some assisted living facilities there may be a significant percentage of individuals with some level of dementia who are not in a purpose-designed secured unit. This has a direct impact on appropriate design for all assisted living facilities to facilitate the highest level of functioning for these residents. The living environment should be equipped with special features, such as personalized resident bedrooms, features that support resident orientation to their surroundings, secured storage, safe outside areas, and security considerations to support individuals with varying levels of cognitive impairment.

A14.32.A. Refer to ANSI/IESNA RP-28, *Lighting and the Visual Environment for Senior Living,* for additional information.

A14.32.B. Refer to the *IES Lighting Handbook* and ANSI/IESNA RP-29, *Lighting for Health Care Facilities,* for additional information.

Excessive differences in lighting levels should be avoided in transition areas between parking lots, building entrances and lobbies or corridors, in transition zones between driveways and parking garages, etc. As the eye ages, pupils become smaller and less elastic, making visual adaptation to dark spaces slower. Upon entering a space with a considerably lower lighting level, elderly residents may need to stop or move to one side until their eyes adapt to excessive lighting changes. Elderly pedestrians may need several minutes to adjust to significant changes in brightness when entering a building from a sunlit walkway or terrace.

Consideration should be given to increasing both indoor and outdoor illumination levels in such transition spaces to avoid excessive differences between electric lighting levels and natural daytime and nighttime illumination levels. In addition, it is very helpful for pedestrians to have conveniently located places to wait, giving them time to adjust their eyes to different lighting environments. Seating areas off busy lobbies or corridors can minimize the potential for accidents by giving them the time they need.

Care should be taken to minimize extremes of brightness within spaces and in transitions between spaces. Excessive brightness contrast from windows or lighting systems can disorient residents.

Lighting that creates glare and colors that do not differentiate between horizontal and vertical planes, or

between objects and their backgrounds (such as handrails or light switches from walls, hardware from doors, faucets from sinks, or control knobs from appliances) should be avoided, unless therapeutic benefits can be demonstrated. (For example, it has been demonstrated that deliberately camouflaged door hardware may help control wandering and elopements by some cognitively impaired residents in Alzheimer's care facilities.)

Care should be taken to avoid injury from lighting fixtures. Light sources that may burn residents or ignite bed linen by direct contact should be covered or protected.

Ambient light levels are determined on a horizontal plane above the floor. The use of this method in the types of areas described should result in values of average illuminance within 10 percent of the values that would be obtained by dividing the area into 2-foot (0.6-meter) squares, taking a reading in each square, and averaging.

The measuring instrument should be positioned so that when readings are taken, the surface of the light-sensitive cell is in a horizontal plane and 30 inches (760 millimeters) above the floor. This can be facilitated by means of a small portable stand of wood or other material that will support the cell at the correct height and in the proper plane. Daylight may be excluded during illuminance measurements. Readings can be taken at night or with shades, blinds, or other opaque covering on the fenestration.

A14.32.G. Assisted living facilities with more than 16 residents or where residents may not be effectively heard by staff members should have an emergency communication or call system. Such a system should be capable of activation/operation from resident use toilets, bedrooms, and bathing areas. The signal should be transmitted to on-duty staff (through fixed locations or wearable devices).

15. ADULT DAY HEALTH CARE FACILITIES

In this edition appendix material appears in the main body of the document; however, it remains advisory only.

*15.1 Statement of Purpose

~~Adult day care facilities shall have a functional program in accordance with Section 1.1.F, indicating their focus as a social or medical model.~~
Adult day health care (ADHC) services are group programs designed to meet the needs of functionally and/or cognitively impaired adults. Adult day health care facilities provide a caring, noninstitutional setting for individuals who, for their own safety and well-being, can no longer be left at home alone. Adult day health care facilities offer protected settings and include a mixture of health and support services. Many offer specialized services such as programs for individuals with Alzheimer's disease, developmental disabilities, traumatic brain injury, mental illness, HIV/AIDS, and vision and hearing impairments. Adult day health care facilities are an integral component of the continuum of care for the elderly and disabled.

15.2 Design Considerations

15.2.A. When possible, the ADHC facility shall be located on the street level or shall be equipped with ramps or elevators to allow easy access for persons with disabilities.

15.2. B. Each adult day health care center, when it is located in facility housing other services, shall have its own identifiable space. When permitted by the approved functional program, support spaces may be shared.

15.2.C. The facility shall have sufficient space to accommodate the full range of program activities and services as required by the functional program. This shall include designated area(s) to be utilized when the privacy of the participants requires it.

15.2.D. The adult day health care facility shall provide social activities and dining areas. Sufficient functional net area shall be at least 30 square feet (9.14 square meters) per intended participant capacity; but not less than 300 net square feet (91.4 square meters).

Additional separate space shall be provided to accommodate individual quiet space(s) within the program area relevant to the program space. This area can be a rest area and/or a designated space that permits privacy and/or to isolate participants who become ill or disruptive or may require rest. It shall be located in an area that can be clearly monitored and near a toilet room.

15.2.E. Appropriate secure medication storage shall be provided.

15.2.F. If required by the functional program, physical rehabilitation therapy areas shall be designed to provide sufficient functional net area of at least 50 square feet (15.24 square meters) per intended participant capacity during a scheduled period to accommodate a full range of approved activities. It shall be flexible and adaptable for both individual and group treatment.

15.2.G. The facility shall provide appropriate space for staff activities. Staff must have access to a nonparticipant toilet.

15.2.H. The center shall provide at least one toilet and one lavatory for each ten participants. Alternative toilet configurations facilitating staff-assisted transfers shall be permitted. At least one assisted bathing fixture shall be provided. The adult day health care toilet and shower rooms shall have an emergency signaling system.

15.2.I. There shall be a space available for participants and family/care givers to have private meeting with staff.

15.2.J. There shall be storage space for program and operating supplies.

15.2.K. Outdoor recreation and/or relaxation area for participants, if provided, shall be accessible to indoor areas. Outdoor areas shall have a fence or landscaping to create a boundary that prevents participants from wandering away.

15.2.L. Ventilation by natural and mechanical means shall be provided. Air conditioning and heating equipment shall be adequate and capable of maintaining the temperature in each room used by participants between 70º F (21º C) and 80º F (27º C).

15.2.M. Lighting shall be engineered to the specific application. Unless alternative lighting levels are justified by the approved functional program, Table 8.4 shall be used as a guide to minimum required ambient and task lighting levels in all rooms, spaces and exterior walkways.

***15.2.M1.** The Illuminating Engineering Society of North America (IESNA) has developed recommended lighting design practices, including minimum lighting levels for nursing facilities and other senior living environments, which in 2001 were adopted as an ANSI standard.

***15.2.M2**. Approaches to buildings and parking lots, and all occupied spaces within buildings, shall have fixtures for lighting. Consideration shall be given to both the quantity and quality of lighting, including contrast in lighting levels, glare control, the special lighting needs of the elderly, area-specific lighting solutions, the use of daylighting, the life cycle costs of lighting, and other lighting design practices as defined and described in ANSI/IESNA RP-28-01.

***15.2.M3.** Resident rooms and toilet rooms shall have general lighting, task lighting, and night lighting. At least one task light shall be provided for each resident. Task light controls shall be readily accessible to residents. At least one low-level night light fixture in each room shall be located close to the floor and controlled at the room entrance. When the approved functional program stipulates staff shall use portable light sources, flexibility may be permitted to omit night lights in resident rooms. All light controls in resident areas shall be quiet-operating.

15.2.M4. Resident unit corridors shall have general illumination with provisions for reducing light levels at night. Corridors and common areas used by residents shall have even light distribution to avoid glare, shadows and scalloped lighting effects. Highly reflective floors shall be avoided.

15.2.N. A telephone(s) shall be available for participant(s) in an area that affords privacy during use.

15.2.O. A housekeeping closet shall be provided that will contain a service sink and provide for the locked safe storage of housekeeping items.

15.2.P. Drinking water shall be easily accessible to the participants.

A15.1. The design of the adult day health care facility's physical environment shall include supports and cues to enhance the participants' ability to function as independently as possible as well as to engage in program activities. The physical environment is intended to accomplish the following:

a. Facilitate the participant's sense of control and self-determination, regardless of his or her level of functioning.

b. Optimize his or her functional level while encouraging independence.

c. Build on the participants' strengths while recognizing their limitations and impairments.

Furniture should be sturdy and secure so that it cannot easily tip when used for support while walking or seating. Furniture should be scaled so that it is easily used by persons with limited agility and shall permit feet to rest on the floor.

The ADHC should have access to a medical/health treatment room.

A covered entrance should be provided to protect participants from inclement weather.

A15.2.M1. The reader should refer to ANSI/IESNA RP-28-01, *Lighting and the Visual Environment for Senior Living,* for additional information.

A15.2.M2. Excessive differences in lighting levels should be avoided in transition areas between parking lots, building entrances and lobbies or corridors, in transition zones between driveways and parking garages, etc. As the eye ages, pupils become smaller and less elastic, making visual adaptation to dark spaces slower. Upon entering a space with a considerably lower lighting level, elderly residents may need to stop or move to one side until their eyes adapt to excessive lighting changes. Elderly pedestrians may need several minutes to adjust to significant changes in brightness when entering a building from a sunlit walkway or terrace.

Consideration should be given to increasing both indoor and outdoor illumination levels in such transition spaces to avoid excessive differences between electric lighting levels and natural daytime and nighttime illumination levels. In addition, it is very helpful for pedestrians to have conveniently located places to wait, giving them time to adjust their eyes to different lighting environments. Seating areas off busy lobbies or corridors can minimize the potential for accidents by giving them the time they need.

Care should be taken to minimize extremes of brightness within spaces and in transitions between spaces. Excessive brightness contrast from windows or lighting systems can disorient residents.

Research has established that older adults sleep best in total darkness. Therefore, to minimize resident sleep disruption, night lights should: (1) provide very low levels of illumination; (2) be so located as to minimize light scatter and reflections on room surfaces; and (3) be switched off when not needed. However, even when properly specified, located and operated, night lights often disturb resident sleep. Therefore, many providers prefer to have staff wear portable light sources instead of using night lights that were installed primarily to satisfy a code requirement.

Lighting that creates glare and colors that do not differentiate between horizontal and vertical planes, or between objects and their backgrounds (such as handrails or light switches from walls, hardware from doors, faucets from sinks, or control knobs from appliances) should be avoided, unless therapeutic benefits can be demonstrated. (For example, it has been demonstrated that deliberately camouflaged door

hardware may help control wandering and elopements by some cognitively impaired residents in Alzheimer's care facilities.)

A15.2.M3. Care should be taken to avoid injury from lighting fixtures. Light sources that may burn residents or ignite bed linen by direct contact should be covered or protected.

Ambient light levels are determined on a horizontal plane above the floor. The use of this method in the types of areas described should result in values of average illuminance within 10 percent of the values that would be obtained by dividing the area into 2-foot (0.6-meter) squares, taking a reading in each square, and averaging.

The measuring instrument should be positioned so that when readings are taken, the surface of the light-sensitive cell is in a horizontal plane and 30 inches (760 millimeters) above the floor. This can be facilitated by means of a small portable stand of wood or other material that will support the cell at the correct height and in the proper plane. Daylight may be excluded during illuminance measurements. Readings can be taken at night or with shades, blinds, or other opaque covering on the fenestration.

~~A15.1 Statement of Purpose~~

~~a. To provide for the establishment of day care centers and services for adults.~~

~~b. To allow individuals to remain at home.~~

~~Adult Day Care facilities should make provisions in accordance with Section 1.1.F, Section 1.4, Section 1.6, Section 3, Section 4, and Section 5.~~

~~Proposed Services~~
~~Services that may be provided by Adult Day Care Centers include the following:~~
~~? Therapeutic arts and crafts~~
~~? Community excursions, if appropriate~~
~~? Hobby cultivation~~
~~? Health services~~
~~? Personal care services~~
~~? Counseling services for elderly individuals and their families~~
~~? Activities of daily living~~
~~? Exercise and rest~~

~~Space Guidelines~~
~~Spaces should be provided as follows:~~

~~a. A minimum of 100 square feet for each of the first five participants and 60 square feet for each additional participant thereafter served at any one time, not including office space, bathrooms, storage rooms, examination rooms, and kitchens.~~

~~b. A quiet room with bed.~~

~~c. One toilet and lavatory for each ten participants.~~

~~d. Staff toilet room~~

~~e. One drinking fountain for participant and staff use~~

~~f. Nurse office with handwashing station~~

~~g. Food preparation and storage in accordance with the functional program.~~

~~h. Demonstration residential kitchen if required by the functional program.~~

Glossary

Preamble:
For the purposes of this manual, specific terms and definitions are provided below to facilitate consistency of interpretation and application of the Guidelines within and across various health care settings.

Administrtive center: Reserved.

Airborne infection isolation room: A single-occupancy room for patient care where environmental factors are controlled in an effort to minimize the transmission of those infectious agents usually spread from person to person by droplet nuclei associated with coughing and inhalation. (Such rooms typically have specific requirements for controlled ventilation, air pressure, and air filtration.)

Ambulatory care: A defined health care encounter(s) of less than 24 hours in duration that requires direct professional health care support within a specific facility.

Ambulatory surgical facility: Any surgical facility organized for the purpose of providing procedural, invasive surgical care to patients with the expectation that they will be recovered sufficiently to be discharged in less than a 24-hour period.

Bed size: For purposes of planning minimum clearances around beds, unless specified otherwise by the functional program, the rectangular dimensions to be utilized are width: 40 inches (101.6 centimeters) and length: 96 inches (2.43 meters).

Bioterrorism: The use, or threat of use, of biological agents to intimidate a political entity or population group.

Clear floor area: The built floor area available for a defined space. Such area would not include other defined spaces (e.g., anterooms, vestibules, toilet rooms, closets, lockers, wardrobes, fixed base cabinets, wall-hung counters, plumbing fixtures, and alcoves).

Differential pressure: A measurable difference in air pressure that creates a directional airflow between adjacent spaces.

Environment of care: Those features in a built health care entity that are created, structured, and maintained to support quality health care.

Handwashing station: An area providing a sink with hot and cold water supply and a faucet that facilitates easy on/off/mixing capabilities. The station includes provision of cleansing agents and drying capability.

Housekeeping: Services anywhere within a health care facility that include general cleaning and tidying and the provision and positioning of identified materials, e.g., soaps, towels, etc. (While routine disinfection protocols can be included in such a definition, the definition is not intended to include complex, non-routine disinfection procedures nor the non-routine disposition of hazardous materials such as potentially toxic drugs or other chemicals and radioactive wastes.)

Infection control risk assessment: A multidisciplinary organizational process that

- focuses on reduction of risk from infection;
- acts through phases of facility planning, design, construction, or renovation; and
- coordinates and weighs knowledge about infection, infectious agents, and care environment and associated human factors with anticipated impacts from site changes and related projects for leadership and other organizational customers.

(This process utilizes expertise in infectious disease, infection control, facility design, engineering, construction, ventilation, epidemiology, and safety as circumstances may indicate.)

Invasive procedure: For the purposes of this document, any procedure that penetrates the protective surfaces of a patient's body (i.e., skin, mucous membrane, cornea) and that is performed with an aseptic field (procedural site). Not included in this category are placement of peripheral intravenous needles or catheters used to administer fluids and medications, including dialysis procedures; gastrointestinal endoscopies (i.e., sigmoidoscopies); insertion of urethral catheters; and other similar procedures.~~Reserved.~~

Minimum clearance: The shortest unencumbered distance from the outermost dimensions of a specified object (often a patient bed) and specified, fixed reference points (e.g., walls, cabinets, sinks, and doors).

Monolithic ceiling: A ceiling constructed with a surface free of fissures, cracks, and crevices. Any penetrations such as lights, diffusers, and access panels shall be sealed or gasketed.

Nurse center: Reserved.

Observation unit (emergency room): An area within an emergency department where one or more patients can be clinically monitored, assessed, and treated by staff for up to 24 hours. (By regulation, if such patients are "observed" for 24 consecutive hours or more, they have the status of inpatients.)

~~**Office surgical facility:** Reserved.~~

Operating room: A room specifically designed for the performance of surgical procedures. (In common understanding, this means most types of surgical procedures, especially those involving the administration of anesthesia, multiple personnel, recovery room access, and a fully controlled environment.)

Perioperative: Patient care and other related supportive activities before, during, or after the operative event.

Protective environment: A bedded unit where severely immunosuppressed patients are cared for (e.g., bone marrow transplant units).

Sealed (tight) room: A room that meets specific ventilation requirements and must have a minimum air leakage to achieve a particular designed air quality, airflow direction, and pressure differential.

Small primary care inpatient facility: Reserved.

Sub-acute care: A segment within a continuum of levels of care determined by patient acuity, clinical stability, and resource needs.

Surgical suite: A space that includes the operating room(s) and support areas.

Swing bed: A patient bed that may be used for varying clinical acuity levels. The built environment for such a bed must be consistent with the highest level of care acuity planned or provided.

Table 7.1
Sound Transmission Limitations in General Hospitals

	Airborne sound transmission class (STC)[1]	
	Partitions	Floors
New construction[2]		
Patient room to patient room	45	40
Public space to patient room[3]	55	40
Service areas to patient room[4]	65	45
Patient room access corridor[5]	45	45
Exam room to exam room	45	--
Exam room to public space	45	--
Toilet room to public space	45	--
Consultation rooms/conference rooms to public space	45	--
Consultation rooms/conference rooms to patient rooms	45	--
Staff lounges to patient rooms	45	--
Existing construction[2]		
Patient room to patient room	35	40
Public space to patient room[3]	40	40
Service areas to patient room[4]	45	45

[1]Sound transmission class (STC) shall be determined by tests in accordance with methods set forth in ASTM E90 and ASTM E413. *Where partitions do not extend to the structure above, sound transmission through ceilings and composite STC performance must be considered.*

[2]Treatment rooms shall be treated the same as patient rooms.

[3]Public space includes corridors (except patient room access corridors), lobbies, dining rooms, recreation rooms, and similar space.

[4]Service areas include kitchens, elevators, elevator machine rooms, laundries, garages, maintenance rooms, boiler and mechanical equipment rooms, and similar spaces of high noise. Mechanical equipment located on the same floor or above patient rooms, offices, nurses stations, and similar occupied space shall be effectively isolated from the floor.

[5]Patient room access corridors contain composite walls with doors/windows and have direct access to patient rooms.

Table 7.2
Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4, 5]	All air exhausted directly to outdoors[6]	Recirculated by means of room units[7]	Relative humidity[8] (%)	Design temperature[9] (degrees F/C)
SURGERY AND CRITICAL CARE							
Operating/surgical cystoscopic rooms[10, 11]	Out	3	15	--	No	30-60	68-73 (20–23)[12]
Delivery room[10]	Out	3	15	--	No	30-60	68-73 (20–23)
Recovery room[10]	--	2	6	--	No	30-60	70-75 (21-24)
Critical and intensive care	--	2	6	--	No	30-60	70-75 (21–24)
Intermediate care--	2	6[13]	--	--	--	--	70-75 (21–24)
Newborn intensive care	--	2	6	--	No	30-60	72-78 (22-26)
Treatment room[~~13~~14]	--	--	6	--	--	--	75 (24)
Trauma room[~~13~~14]	Out	3	15	--	No	30-60	70-75 (21–24)
Anesthesia gas storage	In	--	8	Yes	--	--	--
Gastrointestinal ~~E~~endoscopy room[15]	~~In~~Out	2	6	--	No	30-60	68-73 (20–23)
Bronchoscopy[11]	In	2	12	Yes	No	30-60	68-73 (20–23)
ER waiting rooms	In	2	12	Yes[~~14, 15~~16, 17]	--	--	70-75 (21-24)
Triage	In	2	12	Yes[~~14~~16]	--	--	70-75 (21-24)
Radiology waiting rooms	In	2	12	Yes[~~14, 15~~16, 17]	--	--	70-75 (21-24)
Procedure room	Out	3	15	--	No	30-60	70-75 (21-24)
Laser eye room	Out	3	15	--	No	30-60	70-75 (21-24)
X-ray (surgical/critical care and catheterization)	Out	3	15	--	No	30-60	70-75 (21–24)
NURSING							
Patient room	--	2	~~6[16]~~6[13]	--	--	--	70-75 (21–24)
Toilet room	In	--	10	Yes	--	--	--
Newborn nursery suite	--	2	6	--	No	30-60	72-78 (22-26)
Protective environment room[11, ~~17~~]	Out	2	12	--	No	--	75 (24)
Airborne infection isolation room[11, ~~18~~]	In	2	12	Yes[~~15~~17]	No	--	75 (24)
Isolation alcove or anteroom[~~17, 18~~]	In/Out	--	10	Yes	No	--	--
Labor/delivery/recovery	--	2	6[~~16~~13]	--	--	--	70-75 (21–24)
Labor/delivery/recovery/postpartum	--	2	6[~~16~~13]	--	--	--	70-75 (21–24)
Patient corridor	--	--	2	--	--	--	--
ANCILLARY							
Radiology[~~19~~18]							
~~X-ray (surgical/critical care and catheterization)~~	~~Out~~	~~3~~	~~15~~	~~--~~	~~No~~	~~30-60~~	~~70-75 (21–24)~~

X-ray (diagnostic & treatment)	--	--	6	--	--	--	75 (24)
Darkroom	In	--	10	Yes	No	--	--
Laboratory							
General[~~19~~18]	--	--	6	--	--	--	75 (24)
Biochemistry[~~19~~18]	~~Out~~In	--	6	~~--~~Yes[19]	No	--	75 (24)
Cytology	In	--	6	Yes	No	--	75 (24)
Glass washing	In	--	10	Yes	--	--	--
Histology	In	--	6	Yes	No	--	75 (24)
Microbiology[~~19~~18]	In	--	6	Yes	No	--	75 (24)
Nuclear medicine	In	--	6	Yes	No	--	75 (24)
Pathology	In	--	6	Yes	No	--	75 (24)
Serology	~~Out~~In	--	6	~~--~~ Yes[21]	No	--	75 (24)
Sterilizing	In	--	10	Yes	--	--	--
Autopsy room[11]	In	--	12	Yes	No	--	--
Nonrefrigerated body-holding room	In	--	10	Yes	--	--	70 (21)
Pharmacy	Out	--	4	--	--	--	--
DIAGNOSTIC AND TREATMENT							
Examination room	--	--	6	--	--	--	75 (24)
Medication room	Out	--	4	--	--	--	--
Treatment room	--	--	6	--	--	--	75 (24)
Physical therapy and hydrotherapy	In	--	6	--	--	--	75 (24)
Soiled workroom or soiled holding	In	--	10	Yes	No	--	--
Clean workroom or clean holding	Out	--	4	--	--	--	--
STERILIZING AND SUPPLY							
ETO-sterilizer room	In	--	10	Yes	No	30-60	75 (24)
Sterilizer equipment room	In	--	10	Yes	--	--	--
Central medical and surgical supply							
Soiled or decontamination room	In	--	6	Yes	No	--	68-73 (20–23)
Clean workroom	Out	--	4	--	No	30-60	75 (24)
Sterile storage	Out	--	4	--	--	(Max) 70	--
SERVICE							
Food preparation center[~~20~~]	--	--	10	--	No	--	--
Warewashing	In	--	10	Yes	No	--	--
Dietary day storage	In	--	2	--	--	--	--
Laundry, general	--	--	10	Yes	--	--	--
Soiled linen (sorting and storage)	In	--	10	Yes	No	--	--
Clean linen storage	Out	--	2	--	--	--	--
Soiled linen and trash chute room	In	--	10	Yes	No	--	--
Bedpan room	In	--	10	Yes	--	--	--
Bathroom	In	--	10	--	--	--	75 (24)
Janitor's closet	In	--	10	Yes	No	--	--

[1]The ventilation rates in this table cover ventilation for comfort, as well as for asepsis and odor control in areas of acute care hospitals that directly affect patient care and are determined based on healthcare facilities being predominantly "No Smoking" facilities. Where smoking may be allowed, ventilation rates will need adjustment. Areas where specific ventilation rates are not given in the table shall be ventilated in accordance with ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality*, and ASHRAE *Handbook—HVAC Applications*. Specialized patient care areas, including organ transplant units, burn units, specialty procedure rooms, etc., shall have additional ventilation provisions for air quality control as may be appropriate. OSHA standards and/or NIOSH criteria require special ventilation requirements for employee health and safety within healthcare facilities.

[2]Design of the ventilation system shall provide air movement which is generally from clean to less clean areas. If any form of variable air volume or load shedding system is used for energy conservation, it must not compromise the corridor-to-room pressure balancing relationships or the minimum air changes required by the table.

[3]To satisfy exhaust needs, replacement air from the outside is necessary. Table 7.2 does not attempt to describe specific amounts of outside air to be supplied to individual spaces except for certain areas such as those listed. Distribution of the outside air, added to the system to balance required exhaust, shall be as required by good engineering practice. Minimum outside air quantities shall remain constant while the system is in operation. In variable volume systems, the minimum outside air setting on the air-handling unit shall be calculated using the ASHRAE 62 method.

[4]Number of air changes may be reduced when the room is unoccupied if provisions are made to ensure that the number of air changes indicated is reestablished any time the space is being utilized. Adjustments shall include provisions so that the direction of air movement shall remain the same when the number of air changes is reduced. Areas not indicated as having continuous directional control may have ventilation systems shut down when space is unoccupied and ventilation is not otherwise needed, if the maximum infiltration or exfiltration permitted in Note 2 is not exceeded and if adjacent pressure balancing relationships are not compromised. Air quantity calculations must account for filter loading such that the indicated air change rates are provided up until the time of filter change-out. The minimum total air change requirements for Table 7.2 shall be based on the supply air quantity in positive pressure rooms, and the exhaust air quantity in negative pressure rooms.

[5]Air change requirements indicated are minimum values. Higher values should be used when required to maintain indicated room conditions (temperature and humidity), based on the cooling load of the space (lights, equipment, people, exterior walls and windows, etc.).

[6]Air from areas with contamination and/or odor problems shall be exhausted to the outside and not recirculated to other areas. Note that individual circumstances may require special consideration for air exhaust to the outside, e.g., in intensive care units in which patients with pulmonary infection are treated, and rooms for burn patients.

*[7]Recirculating room HVAC units refers to those local units that are used primarily for heating and cooling of air, and not disinfection of air. Because of cleaning difficulty and potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." However, for airborne infection control, air may be recirculated within individual isolation rooms if HEPA filters are used. Isolation and intensive care unit rooms may be ventilated by reheat induction units in which only the primary air supplied from a central system passes through the reheat unit. Gravity-type heating or cooling units such as radiators or convectors shall not be used in operating rooms and other special care areas. See Appendix A for a description of recirculation units to be used in isolation rooms.

[8]The ranges listed are the minimum and maximum limits where control is specifically needed. The maximum and minimum limits are not intended to be independent of a space's associated temperature. The humidity is expected to be at the higher end of the range when the temperature is also at the higher end, and vice versa.

[9]Where temperature ranges are indicated, the systems shall be capable of maintaining the rooms at any point within the range during normal operation. A single figure indicates a heating or cooling capacity of at least the indicated temperature. This is usually applicable when patients may be undressed and require a warmer environment. Nothing in these guidelines shall be construed as precluding the use of temperatures lower than those noted when the patients' comfort and medical conditions make lower temperatures desirable. Unoccupied areas such as storage rooms shall have temperatures appropriate for the function intended.

[10]National Institute for Occupational Safety and Health (NIOSH) Criteria Documents regarding Occupational Exposure to Waste Anesthetic Gases and Vapors, and Control of Occupational Exposure to Nitrous Oxide indicate a need for both local exhaust (scavenging) systems and general ventilation of the areas in which the respective gases are utilized.

[*11]Differential pressure shall be a minimum of 0.01" water gauge (2.5 Pa). If alarms are installed, allowances shall be made to prevent nuisance alarms of monitoring devices.

[12]Some surgeons may require room temperatures that are outside of the indicated range. All operating room design conditions shall be developed in consultation with surgeons, anesthesiologists, and nursing staff. See Figure 7.1 for a graphic representation of the indicated changes on a psychrometric chart. Shaded area is acceptable range.

[13]Total air changes per room for patient rooms, intermediate care, labor/delivery/recovery rooms, and labor/delivery/recovery/postpartum rooms may be reduced to 4 when supplemental heating and/or cooling systems (radiant heating and cooling, baseboard heating, etc.) are used.

[~~13~~14]The term *trauma room* as used here is the operating room space in the emergency department or other trauma reception area that is used for emergency surgery. The first aid room and/or "emergency room" used for initial treatment of accident victims may be ventilated as noted for the "treatment room." Treatment rooms used for Bronchoscopy shall be treated as Bronchoscopy rooms. Treatment rooms used for cryosurgery procedures with nitrous oxide shall contain provisions for exhausting waste gases.

*[15] This line item refers to the actual endoscopic procedure room, with the exception of rooms used for the specific endocopic procedure of bronchoscopy. Any adjacent area utilized for cleaning of endoscopic equipment shall be maintained at a negative pressure with respect to the gastrointestinal endoscopy room and surrounding areas.

[~~14~~16]In a ventilation system that recirculates air, HEPA filters can be used in lieu of exhausting the air from these spaces to the outside. In this application, the return air shall be passed through the HEPA filters before it is introduced into any other spaces.

[~~15~~17] If it is not practical to exhaust the air from the airborne infection isolation room to the outside, the air may be returned through HEPA filters to the air-handling system exclusively serving the isolation room.

~~[16]Total air changes per room for patient rooms, labor/delivery/recovery rooms, and labor/delivery/recovery/postpartum rooms may be reduced to 4 when supplemental heating and/or cooling systems (radiant heating and cooling, baseboard heating, etc.) are used.~~

~~[17]The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., Aspergillus spores). These special ventilation areas shall be designed to provide directed airflow from the cleanest patient care area to less clean areas. These rooms shall be protected with HEPA filters at 99.97 percent efficiency for a 0.3 µm sized particle in the supply airstream. These interrupting filters protect patient rooms from maintenance-derived release of environmental microbes from the ventilation system components. Recirculation HEPA filters can be used to increase the equivalent room air exchanges. Constant volume airflow is required for consistent ventilation for the protected environment. If the facility determines that airborne infection isolation is necessary for protective environment patients, an anteroom should be provided. Rooms with reversible airflow provisions for the purpose of switching between protective environment and airborne infection isolation functions are not acceptable.~~

~~[18]The infectious disease isolation room described in these guidelines is to be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. The design of airborne infection isolation (AII) rooms should include the provision for normal patient care during periods not requiring isolation precautions. Supplemental recirculating devices may be used in the patient room, to increase the equivalent room air exchanges; however, such recirculating devices do not provide the outside air requirements. Air may be recirculated within individual isolation rooms if HEPA filters are used. Rooms with reversible airflow provisions for the purpose of switching between protective environment and AII functions are not acceptable.~~

[~~19~~18]When required, appropriate hoods and exhaust devices for the removal of noxious gases or chemical vapors shall be provided (see Sections 7.31.D14 and 7.31.D15 and NFPA 99).

~~[20]Food preparation centers shall have ventilation systems whose air supply mechanisms are interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit corridors does not compromise the exit corridor restrictions of NFPA 90A, the pressure requirements of NFPA 96, or the maximum defined in the table. The number of air changes may be reduced or varied to any extent required for odor control when the space is not in use. See Section 7.31.D1.p.~~

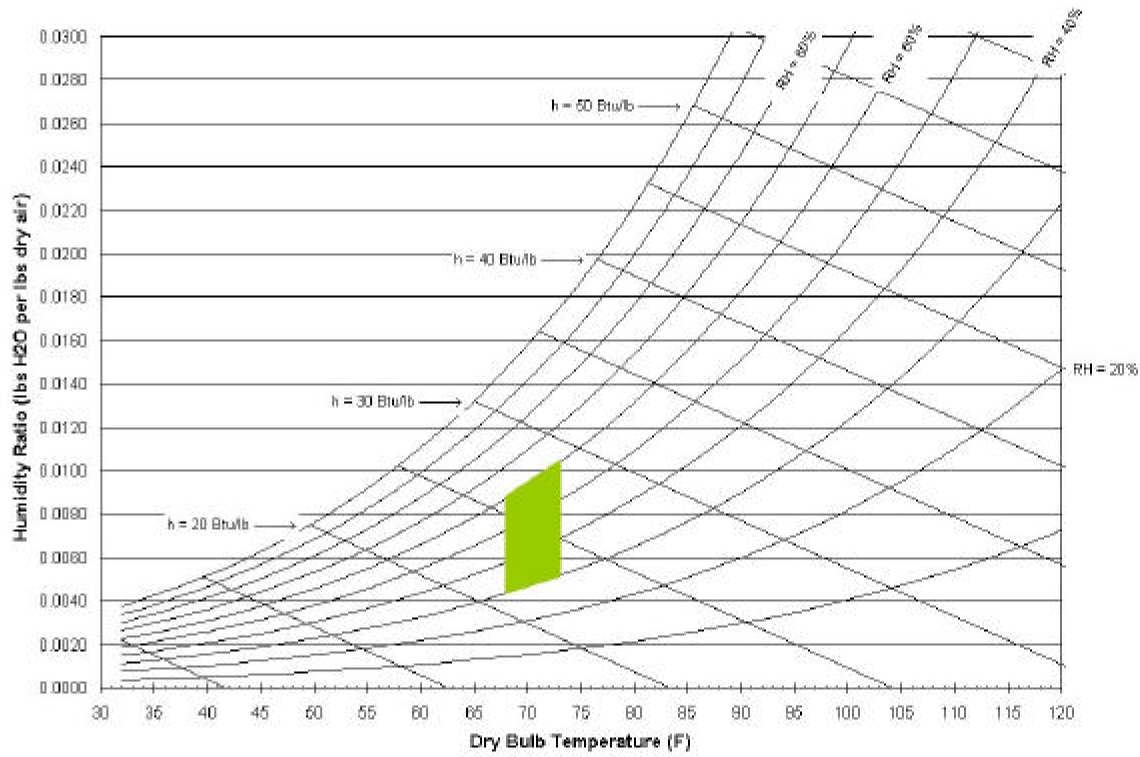
[19]The air movement relationships for laboratories apply between laboratory and adjacent non-laboratory spaces. Reference AIA and BMBL Guidelines.

[A7]Recirculating devices with HEPA filters may have potential uses in existing facilities as interim, supplemental environmental controls to meet requirements for the

control of airborne infectious agents. Limitations in design must be recognized. The design of either portable or fixed systems should prevent stagnation and short circuiting of airflow. The supply and exhaust locations should direct clean air to areas where health care workers are likely to work, across the infectious source, and then to the exhaust, so that the health care worker is not in position between the infectious source and the exhaust location. The design of such systems should also allow for easy access for scheduled preventative maintenance and cleaning.

[A11]The verification of airflow direction can include a simple visual method such as smoke trail, ball-in-tube, or flutterstrip. These devices will require a minimum differential air pressure to indicate airflow direction.

[A15]The gastrointestinal endoscopy room functions as a minor procedure room, and a positive pressure in the patient procedure room reduces the infiltration of contaminants from the corridor and adjacent areas. The space requiring negative pressure (to control odors due to cleaning agents) is actually the equipment cleaning area associated with the endoscopy room. Procedure rooms used for bronchoscopy are an exception, requiring negative pressure in the patient area. (See Table 7.2 Bronchoscopy.)


Psychrometric Chart
Humidity Ratio (lbs H2O per lbs dry air)
Dry Bulb Temperature (F)
h = 50 Btu/lb
h = 40 Btu/lb
h = 30 Btu/lb
h = 20 Btu/lb
RH = 80%
RH = 60%
RH = 40%
RH = 20%
0.0300
0.0280
0.0260
0.0240
0.0220
0.0200
0.0180
0.0160
0.0140
0.0120
0.0100
0.0080
0.0060
0.0040
0.0020
0.0000
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35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
110
115
120

Table 7.3
Filter Efficiencies for Central Ventilation and Air Conditioning Systems in General Hospitals

Area designation	No. filter beds	Filter bed no. 1 (%, MERV)	Filter bed no. 2 (%, MERV)
All areas for inpatient care, treatment, and diagnosis, and those areas providing direct service or clean supplies such as sterile and clean processing, etc.	2	30 (7)	90 (14)
Protective environment room	2	30 (7)	99.97 (16)
Laboratories	1	80 (13)	--
Administrative, bulk storage, soiled holding areas, food preparation areas, and laundries	1	30 (7)	--

Notes

MERV = minimum efficiency rating value. MERVs are based on ASHRAE 52.2.

Additional roughing or prefilters should be considered to reduce maintenance required for filters with efficiency higher than 75 percent.

The filtration efficiency ratings are based on average dust spot efficiency per ASHRAE 52.1-1992.

Table 7.4
Hot Water Use—General Hospital

	Clinical	Dietary	Laundry
Liters per hour per bed[1]	11.9	7.2	7.6
Gallons per hour per bed[1]	3	2	2
Temperature (°C)	41-49[2]	49[3]	71[4]
Temperature (°F)	105-120[2]	120[3]	160[4]

[1]Quantities indicated for design demand of hot water are for general reference minimums and shall not substitute for accepted engineering design procedures using actual number and types of fixtures to be installed. Design will also be affected by temperatures of cold water used for mixing, length of run and insulation relative to heat loss, etc. As an example, total quantity of hot water needed will be less when temperature available at the outlet is very nearly that of the source tank and the cold water used for tempering is relatively warm.

[2]The range represents the maximum and minimum allowable temperatures.

[3]Provisions shall be made to provide 180°F (82°C) rinse water at warewasher (may be by separate booster) unless a chemical rinse is provided.

[4]Provisions shall be made to provide 160°F (71°C) hot water at the laundry equipment when needed. (This may be by steam jet or separate booster heater.) However, it is emphasized that this does not imply that all water used would be at this temperature. Water temperatures required for acceptable laundry results will vary according to type of cycle, time of operation, and formula of soap and bleach as well as type and degree of soil. Lower temperatures may be adequate for most procedures in many facilities, but the higher 160°F (71°C) should be available when needed for special conditions.

Table 7.5
Station Outlets for Oxygen, Vacuum (Suction), and Medical Air Systems in Hospitals [1]

Section	Location	Oxygen	Vacuum	Medical Air
7.2.A	Patient rooms (medical and surgical)	1/bed	1/bed	--
7.2.B10	Examination/treatment (medical, surgical, and postpartum care)	1/room	1/room	--
7.2.C/7.2.D	Isolation—infectious and protective (medical and surgical)	1/bed	1/bed	--
7.2.E	Security room (medical, surgical, and postpartum)	1/bed	1/bed	--
7.3	Intermediate care	2/bed	2/bed	1/bed
7.~~3~~4.A	Critical care (general)	3/bed	3/bed	1/bed
7.~~3~~4.A14	Isolation (critical)	3/bed	3/bed	1/bed
7.~~3~~4.B	Coronary critical care	3/bed	2/bed	1/bed
7.~~3~~4.D	Pediatric critical care	3/bed	3/bed	1/bed
7.~~3~~4.E	Newborn intensive care	3/bassinet	3/bassinet	3/bassinet
7.~~4~~5.B	Newborn nursery (full-term)	1 per 4 bassinets [2]	1 per 4 bassinets [2]	1 per 4 bassinets [2]
7.~~5~~6.A	Pediatric and adolescent	1/bed	1/bed	1/bed
7.~~5~~6.B	Pediatric nursery	1/bassinet	1/bassinet	1/bassinet
7.~~6~~7.A	Psychiatric patient rooms	--	--	--
7.~~6~~7.~~D~~C	Seclusion treatment room	--	--	--
7.~~7~~9.~~A~~B1	General operating room	2/room	3/room	--
7.~~7~~9.~~A~~B2	Cardio, ortho, neurological	2/room	3/room	--
7.~~7~~9.~~A~~B3	Orthopedic surgery	2/room	3/room	--
7.~~7~~9.~~A~~B4	Surgical cysto and endo	1/room	3/room	--
7.~~7~~9.~~B~~C2	Post-anesthesia care unit	1/bed	3/bed	1/bed
7.~~7~~9.~~C~~D9	Anesthesia workroom	1 per workstation	--	1 per workstation
7.~~7~~9.~~C~~D14	Phase II recovery [3]	1/bed	3/bed	--

7.~~8~~10.~~B~~A2.a	Postpartum bedroom	1/bed	1/bed	--
7.~~8~~10.A3	Cesarean/delivery room	2/room	3/room	1/room
7.~~8~~10.A3.c	Infant resuscitation station[4]	1/bassinet	1/bassinet	1/bassinet
7.~~8~~10.A3.d	Labor room	1/room	1/room	1/room
7.~~8~~10.A3.e	OB recovery room	1/bed	3/bed	1/room
7.~~8~~10.A4	Labor/delivery/recovery (LDR)~~[5]~~	~~2~~1/bed	~~2~~1/bed	--
7.~~8~~10.A4	Labor/delivery/recovery/ postpartum (LDRP)~~[5]~~	~~2~~1/bed	1~~2~~/bed	--
7.~~9~~11.C~~2~~3	Initial emergency management	1/bed	1/bed	--
7.~~9~~11.D3	Triage area (definitive emergency care)	1/station	1/station	--
7.~~9~~11.D7	Definitive emergency care exam/treatment rooms	1/bed	1/bed	1/bed
7.~~9~~11.D7	Definitive emergency care holding area	1/bed	1/bed	--
7.~~9~~11.D8	Trauma/cardiac room(s)	2/bed	3/bed	1/bed
7.~~9~~11.D9	Orthopedic and cast room	1/room	1/room	--
7.12E	MRI	1/room	1/room	1/room
7.12~~0~~.H	Cardiac catheterization lab	2/bed	2/bed	2/bed
7.19~~6~~.A2	Autopsy room	--	1 per workstation	--~~1 per workstation~~

[1]For any area or room not described above, the facility clinical staff shall determine outlet requirements after consultation with the authority having jurisdiction.
[2]Four bassinets may share one outlet that is accessible to each bassinet.
[3]If Phase II recovery area is a separate area from the PACU, only one vacuum per bed or station shall be required.
[4]When infant resuscitation takes place in a room such as cesarean section/delivery or LDRP, then the infant resuscitation services must be provided in that room in addition to the minimum service required for the mother.
~~[5]Two outlets for mother and two for one bassinet.~~

Table 8.1
Pressure Relationships and Ventilation of Certain Areas of Nursing Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]	Relative humidity[7] (%)	Design temperature[8] (degrees F/C)
Resident room	—	2	2	—	—	—[97]	70-75 (21–24)
Resident unit corridor	—	—	4	—	—	—[97]	—
Resident gathering areas	—	4	4	—	—	—	—
Toilet Room	In	—	10	Yes	No	—	—
Dining rooms	—	2	4	—	—	—	75
Activity rooms, if provided	—	4	46	—	—	—	—
Physical therapy	In	2	6	—	—	—	75 (24)
Occupational therapy	In	2	6	—	—	—	75 (24)
Soiled workroom or soiled holding	In	2	10	Yes	No	—	—
Clean workroom or clean holding	Out	2	4	—	—	(Max) 70	75 (24)
Sterilizer exhaust room	In	—	10	Yes	No	—	—
Linen and trash chute room, if provided	In	—	10	Yes	No	—	—
Laundry, general, if provided	—	2	10	Yes	No	—	—
Soiled linen sorting and storage	In	—	10	Yes	No	—	—
Clean linen storage	Out	—	2	Yes	No	—	—
Food preparation facilities[109]	—	2	10	Yes	Yes	—	—
Dietary warewashing	In	—	10	Yes	Yes	—	—
Dietary storage areas	—	—	2	Yes	No	—	—
Housekeeping rooms	In	—	10	Yes	No	—	—
Bathing rooms	In	—	10	Yes	No	—	75 (24)
Personal services (barber/beauty)	In	2	20	Yes	No		

[1]The ventilation rates in this table cover ventilation for comfort, as well as for asepsis and odor control in areas of nursing facilities that directly affect resident care and are determined based on nursing facilities being predominantly "No Smoking" facilities. Where smoking may be allowed, ventilation rates will need adjustments. Areas where specific ventilation rates are not given in the table shall be ventilated in accordance with ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality,* and ASHRAE *Handbook—HVAC Applications.* OSHA standards and/or NIOSH criteria require special ventilation requirements for employee health and safety within nursing facilities.

[2]Design of the ventilation system shall, insofar as possible, provide that air movement is from "clean to less clean" areas. However, continuous compliance may be impractical with full utilization of some forms of variable air volume and load shedding systems that may be used for energy conservation. Areas that do require positive and continuous control are noted with "Out" or "In" to indicate the required direction of air movement in relation to the space named. Rate of air movement may, of course, be varied as needed within the limits required for positive control. Where indication of air movement direction is enclosed in parentheses, continuous directional control is required only when the specialized equipment or device is in use or where room use may otherwise compromise the intent of movement from clean to less clean. Air movement for rooms with dashes and nonpatient areas may vary as necessary to satisfy the requirements of those spaces. Additional adjustments may be needed when space is unused or unoccupied and air systems are deenergized or reduced.

[3]To satisfy exhaust needs, replacement air from outside is necessary. Table 8.1 does not attempt to describe specific amounts of outside air to be supplied to individual spaces

except for certain areas such as those listed. Distribution of the outside air, added to the system to balance required exhaust, shall be as required by good engineering practice.

[4]Number of air changes may be reduced when the room is unoccupied if provisions are made to ensure that the number of air changes indicated is reestablished any time the space is being utilized. Adjustments shall include provisions so that the direction of air movement shall remain the same when the number of air changes is reduced. Areas not indicated as having continuous directional control may have ventilation systems shut down when space is unoccupied and ventilation is not otherwise needed.

[5]Air from areas with contamination and/or odor problems shall be exhausted to the outside and not recirculated to other areas. Note that individual circumstances may require special consideration for air exhaust to outside.

[6]Because of cleaning difficulty and potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." Isolation rooms may be ventilated by reheat induction units in which only the primary air supplied from a central system passes through the reheat unit. Gravity-type heating or cooling units such as radiators or convectors shall not be used in special care areas.

[7]The ranges listed are the minimum and maximum limits where control is specifically needed. See A8.31.D1 for additional information.

[8]Where temperature ranges are indicated, the systems shall be capable of maintaining the rooms at any point within the range. A single figure indicates a heating or cooling capacity of at least the indicated temperature. This is usually applicable where residents may be undressed and require a warmer environment. Nothing in these guidelines shall be construed as precluding the use of temperatures lower than those noted when the residents' comfort and medical conditions make lower temperatures desirable. Unoccupied areas such as storage rooms shall have temperatures appropriate for the function intended.

~~[9]See A8.31.D1.~~

[~~10~~9]Food preparation facilities shall have ventilation systems whose air supply mechanisms are interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit corridors does not compromise the exit corridor restrictions of NFPA 90A, the pressure requirements of NFPA 96, or the maximum defined in the table. The number of air changes may be reduced or varied to any extent required for odor control when the space is not in use.

Table 8.2
Filter Efficiencies for Central Ventilation and Air Conditioning Systems in Nursing Facilities

Area designation	Minimum number of filter beds	Filter efficiencies (%, MERV)	
		Filter bed no. 1	Filter bed no. 2
All areas for inpatient care, treatment, and/or diagnosis, and those areas providing direct service or clean supplies	2	30 (7)	80 (13)
Administrative, bulk storage, soiled holding, laundries, food preparation areas	1	30 (7)	

Notes:
MERV = minimum efficiency rating value. MERVs are based on ASHRAE 52.2.
The filtration efficiency ratings are based on average dust spot efficiency per ASHRAE 52.1-92.

Table 8.3
Hot Water Use—Nursing Facilities

	Resident care areas	Dietary	Laundry
Liters per hour per bed[1]	11.9	7.2	7.6
Gallons per hour per bed[1]	3	2	2
Temperature (°Centigrade)	35-43[2]	60[3]	60[4]
Temperature (°Fahrenheit)	95-110[2]	140 (min.)[3]	140 (min.)[4]

[1]Quantities indicated for design demand of hot water are for general reference minimums and shall not substitute for accepted engineering design procedures using actual number and types of fixtures to be installed. Design will also be affected by temperatures of cold water used for mixing, length of run and insulation relative to heat loss, etc. As an example, total quantity of hot water needed will be less when temperature available at the outlet is very nearly that of the source tank and the cold water used for tempering is relatively warm.

[2]The range represents the maximum and minimum allowable temperatures.

[3]Provisions ~~may~~ shall be made to provide 180°F (82°C) rinse water at warewasher (may be by separate booster) unless a chemical rinse is provided.

[4]Provisions shall be made to provide 160°F (71°C) hot water at the laundry equipment when needed. (This may be by steam jet or separate booster heater.) However, it is emphasized that this does not imply that all water used would be at this temperature. Water temperatures required for acceptable laundry results will vary according to type of cycle, time of operation, and formula of soap and bleach as well as type and degree of soil. Lower temperatures may be adequate for most procedures in many facilities but higher temperatures should be available when needed for special conditions. Minimum laundry temperatures are for central laundries only.

Table 8.4
Minimum Maintained Average Illuminance

	Ambient Light In		Task Light In	
	Lux	Footcandles	Lux	Footcandles
Exterior Entrance (Night)	100	10		
Interior Entry (Day)	1000*	100*		
Interior Entry (Night)	100	10		
Exit Stairways and Landings	300	30		
Elevator Interiors	300	30		
Parking Garage Entrance	500	50		
Exterior Walkways	50	5		
Administration (Active)	300	30	500	50
Active Areas (Day Only)	300	30	500	50
Visitor Waiting (Day)	300	30		
Visitor Waiting (Night)	100	10		
Resident Room				
Entrance	300	30		
Uving Room	300	30	750	75
Bedroom	300	30	750	75
Wardrobe/Closet	300	30		
Bathroom	300	30		
Make-up/Shaving Area	300	30	600	60
Shower/Bathing Rooms	300	30		
Kitchen Area	300	30	500	50
Barber/Beautician (Day)	500	50		
Chapel or Quiet Area (Active)	300	30		
Hallways (Active Hours)	300	30		
Hallways (Sleeping Hours)	100	10		
Dining (ActiveHours)	500	50		
Medicine Preparation	300	30	1000	100
Nurses Station (Day)	300	30	500	50
Nurses Station (Night)	100	10	500	50
Physical Therapy Area (Active Hours)	300	30	500	50
Occupational Therapy (Active Hours)	300	30	500	50
Examination Room (Dedicated)	300	30	1000	100
Janitor's Closet	300	30		
Laundry(ActiveHours)	300	30	500	50
Clean/Soiled Utility	300	30		
Commercial Kitchen	500	50	1000	100
Food Storage (Non-Refrigerated)	300	30		
Staff Toilet Area	200	20	600	60

*Utilization of daylight is encouraged in entryways to provide a transition between outside and interior illumination levels.

Note: Ambient light levels are minimum averages measured at 76 cm (30 in.) above the floor in a horizontal plane. Task iight levels are absolute minimums taken on the visual task. For make-up/shaving, the measurement is to be taken on the face in a vertical position.

Note: It should be understood that the values listed are minimums. The optimum solution for task lighting is to give users control over the intensity and positioning of the light source to meet their individual needs.

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Table 9.1

Filter Efficiencies for Central Ventilation and Air Conditioning Systems in Outpatient Facilities

Area designation	No. filter beds	Filter bed no. 1 (%, MERV)	Filter bed no. 2[1] (%, MERV)
All areas for patient care, treatment, and/or diagnosis, and those areas providing direct service or clean supplies such as sterile and clean processing, etc.	2	30 (7)	90 (14)
Laboratories	1	80 (13)	--
Administrative, bulk storage, soiled holding areas, food preparation areas, and laundries	1	30 (7)	--

[1]These requirements do not apply to small primary (neighborhood) outpatient facilities or outpatient facilities that do not perform invasive applications or procedures.

Notes.

Additional roughing or prefilters should be considered to reduce maintenance required for main filters.

MERV = minimum efficiency rating value. MERVs are based on ASHRAE 52.2.

The filtration efficiency ratings are based on average dust spot efficiency per ASHRAE 52.1-1992.

Table 9.2
Station Outlets for Oxygen, Vacuum, and Medical Air in Outpatient Facilities

Section	Location	Oxygen	Vacuum	Medical Air
9.2.B1 & B2	Examination	0	0	--
9.2.B3	Treatment	0	0	--
9.2.B11	Isolation	0*	0*	--
9.5.F1	Pre-procedure examination	0*	0*	--
	Operating room			
9.5.F2.b	Class A–minor surgical procedure room	1	1	--
9.5.F2.c	Class B–intermediate surgical procedure room	2	2	--
9.5.F2.d	Class C–major surgical procedure room	2	3	--
9.5.F3	Post-anesthesia recovery	1	1	--
9.5.F4	Step down recovery area	0*	0*	--
--	Cysto procedure	1	3	--
	Emergency			
9.6.E1	Trauma/cardiac room	1	1	1
--	Cast room	0*	0*	--
--	Catheterization room	1	2	2
9.7.C1	Birthing room	2	2	--
	Endoscopy			
9.9.A3	Procedure room	~~2~~1	3	--
9.9.B2f	Decontamination room	--	--	--
9.9.B3	Holding/prep/recovery area	0*	0*	--

*Portable or hard-piped source should be available for the space.

Table 11.1
Filter Efficiencies for Central Ventilation and Air Conditioning Systems in Psychiatric Hospitals

Area	Minimum number of filter beds	Filter efficiencies (%, MERV)	
		Filter bed 1	Filter bed 2
All areas for inpatient care, treatment, and diagnosis, and those areas providing direct services	2	30 (7)	90 (14)
Administrative, bulk storage, soiled holding, laundries, food preparation areas	1	30 (7)	--

Notes:

MERV = minimum efficiency rating value. MERVs are based on ASHRAE 52.2.

Filtration efficiency ratings are based on average dust spot efficiency per ASHRAE 52.1-1992.