

Michigan Department of Community Health

**THE 2007 MINIMUM DESIGN STANDARDS
FOR
HEALTH CARE FACILITIES
IN MICHIGAN**



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FACILITIES IN MICHIGAN**

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FOREWORD

This document updates and replaces the 1998 Minimum Design Standards for Health Care Facilities in Michigan, and Interpretive Bulletins issued in 2003 and 2004. It was produced in light of the efforts of the American Institute of Architects Academy of Architecture for Health (AIA/AAH) in their drafting of the 2006 Guidelines for Design and Construction of Health Care Facilities.

SIGNIFICANT CHANGES FROM THE 1998 EDITION

Overall:

- Issued only as a PDF file with changes indicated by a vertical line
- Appendix reformatted to immediately follow the referenced text and highlighted
- General update to match current trends and technologies
- Previously issued Interpretive Bulletins incorporated
- Patient privacy provisions reinforced
- Commissioning reinforced
- Expansion/refinement of Infection Control Risk Assessment (ICRA)
- Clarified definitions and specifications for “Handwashing facilities”

Hospitals:

- Staff multipurpose (conference/lounge) room required to be available to all clinical departments
- Added day/dining requirements for Long Term Acute Care hospitals
- Protective Isolation Room specifications added
- Line of sight requirement in ICU’s dropped with physiological monitoring
- NICU space requirements increased per bassinet and maximum number of bassinets per room decreased
- Removed requirement for separate housekeeping closet for full term and special care nurseries
- Added requirement for windows in psychiatric day/dining and seclusion rooms
- Specified detail and finish requirements in psychiatric units
- Prohibition for floor drains in surgical cystoscopy/endoscopy rooms
- Dropped requirement for surgical and delivery locker rooms to be on restricted corridor
- Reinforced requirements for flash sterilization facilities
- Specified required amount of surgical equipment storage
- Added requirement for patient decontamination
- Created standards for various procedure rooms
- Specified arrangement of central stores
- Clarified eyewash requirements
- Added prohibition against hot exposed surfaces
- Made a two elevator minimum for inpatient access
- Addressed HVAC energy recovery units
- Require air conditioning in patient rooms
- Reduced the separation distance between air intakes and most exhaust outlets
- Prohibit plenum return in patient care areas
- Require greater net air flows from/to various Critical Environments
- Converted from dust spot to MERV filter efficiency ratings
- Specified minimum on-site boiler fuel requirements
- Clarified the required number of medical gas/vacuum in various rooms
- Simplified lighting table with some reductions

- Development of electrical receptacle table
- Development of table with clarification of nurse call systems
- Clarified/expanded scope for emergency power systems
- Added window requirements for physical rehabilitation day/dining rooms
- Added graspability requirements for handrails in physical rehabilitation units

Long Term Care:

- Reduced handwashing requirements in private rooms that share a toilet room
- Require handwashing in all new/renovated semi-private rooms
- Added requirements for chronic ventilator dependent care units
- Added graspability requirements for handrails
- Added prohibition against hot exposed surfaces
- Clarified the requirements for individual through wall heating/cooling units
- Increased emergency heating and power requirement to 24 hours in the event of loss of electrical service
- Added requirement for air conditioning in resident areas and provision for maintaining air conditioning in a portion of the building in the event of loss of electrical service as per federal standards

Chapter 9:

- Reorganized/simplified to reflect only Freestanding Surgical Outpatient Facilities
- Specified required amount of surgical equipment storage
- Boiler requirements reduced
- Reference back to new lighting, receptacle, and nurse call tables

Chapter 11:

- Entirely new chapter for freestanding psychiatric hospitals

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1 INTRODUCTION

1.1 General

1.1.A This document contains information intended as minimum design standards for health care facilities in Michigan. Details of architecture and engineering are part of good design practice and local building regulations. Design of new and renovated facilities shall conform to the requirements of these Standards. Requirements set forth in these Standards shall be considered as minimum as per section 21523(2) of P.A. 368.

Highlighted text is advisory only in nature.

1.1.B For the purposes of this document the Michigan Department of Community Health (MDCH) is the Authority Having Jurisdiction (AHJ).

A.1.1.B The Centers for Medicare and Medicaid Services (CMS), 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.C The health care provider shall supply for each project submitted for plan review, an operational narrative as outlined in MDCH publication BHS/HFS-550. Those services available elsewhere in the institution or community need not be duplicated in the facility. The operational narrative shall also address the potential future expansion of essential services which may be needed to accommodate increased demand. The operational narrative shall be made available for use in the development of project design and construction documents.

1.1.D Where new construction, additions, renovation, or replacement work is done, it shall comply with the Fire Prevention Code, Act 207 of 1941, as amended.

A.1.1.D For health care facilities in Michigan the Fire Prevention Code is enforced by the Michigan Department of Labor and Economic Growth, Bureau of Fire Services:
<http://www.michigan.gov/bfs>

1.2 Renovation

1.2.A Where renovation or replacement work is done within an existing licensed facility the work shall comply with applicable sections of the Michigan Building Code, R 408.30401 et seq., of the Michigan Administrative Code, Michigan Electrical Code, R 408.30801 et seq., of the Michigan Administrative Code, Michigan Mechanical Code, R 408.30901a et seq., of the Michigan Administrative Code, Michigan Plumbing Code, , R 408.30701 et seq., of the Michigan Administrative Code, Michigan Elevator Code, R 408.8101 et seq., of the Michigan Administrative Code, and the Michigan Board of Boiler Rules General Rules, R 408.4001 et seq., of the Michigan Administrative Code.

Exception: Where building conditions occur in an existing licensed facility, and all supporting rooms, areas or equipment outlined in these Standards cannot be reasonably accommodated, the AHJ may grant approval to deviate from the design standards if:

- a. The facility in question is currently in operation,
- b. The licensure status (hospital, nursing home, etc.) of the facility is not proposed to change,

- c. The existing facility meets current fire safety rules, or is approved for continued operation by the Michigan Department of Labor and Economic Growth, Bureau of Fire Services, and
- d. An operational narrative is provided which:
 - (1) Indicates those rooms, areas, or equipment that cannot be accommodated;
 - (2) Indicates all building constraints that preclude inclusion of specific elements; and
 - (3) Indicates option(s) that can be provided to support the service or activity without compromising patient care or safety.

1.2.B In renovation projects and those making additions to existing facilities, only that portion of the total facility affected by the project shall be required to comply with applicable sections of the Standards.

1.2.C Those existing portions of the facility which are not included in the renovation, but which 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.

1.2.D Additions or renovations 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.

A.1.2.D The following are examples of what is intended:

- a. If an existing hospital has 6 foot wide corridors, these corridors could not be reduced in width during renovations, even though the requirements for existing buildings do not require 6 foot wide corridors.
- b. If a hospital has 10 foot wide corridors, they may be reduced to 8 feet width, which is the requirement for new construction.
- c. If a hospital were to have a passageway that is only 3 feet wide, it would have to be increased to 4 feet, which is the minimum requirement for existing buildings.
- d. If the hospital has an existing 7 foot wide corridor that is contained within a portion of the building to be renovated, it would normally be required to be increased to 8 feet. However, if the buildings column spacing limits corridor width to 7 feet, and there is no easy or practical way to achieve an 8 foot corridor width, the AHJ would determine if a 7 foot corridor is adequate.

1.3 Design Standards for the Disabled

Health care facility construction shall meet the accessibility requirements as set forth in 1966 PA 1 and the Michigan Building Code, R 408.30401 et seq., of the Michigan Administrative Code.

1.4 Provisions for Disasters

In locations where there is recognized potential for natural and other 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.

A.1.4 Owners of existing facilities should undertake a vulnerability risk assessment of their facility with respect to its ability to withstand the effects of various disasters. The assessment should consider performance of structural and other critical 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 emergency response.

Facilities should be designed to meet the wind and earthquake resistant requirements of the local building codes provided these requirements are substantially equivalent to ASCE 7-93.

1.5 Codes and Standards

Where new work or additions are done it shall comply with applicable sections of the Michigan Building Code, R 408.30401 et seq., of the Michigan Administrative Code, Michigan Electrical Code, R 408.30801 et seq., of the Michigan Administrative Code, Michigan Plumbing Code, R 408.30701 et seq., of the Michigan Administrative Code, Michigan Elevator Code, R 408.8101 et seq., of the Michigan Administrative Code, Michigan Uniform Energy Code, R 408.31061 et seq., of the Michigan Administrative Code, Michigan Elevator Code, R 408.8101 et seq., of the Michigan Administrative Code, Michigan Board of Boiler Rules General Rules, R 408.4001 et seq., of the Michigan Administrative Code, and the Michigan Mechanical Code, R 408.30901a et seq., of the Michigan Administrative Code, including the international fuel gas code listed in chapter 35.

A.1.5 Where these standards or the above referenced codes are silent, the project should comply with NFPA standards.

1.5.A Insofar as practical, these 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 minimum practical standard for normal operation.

In all cases where specific limits are described, equivalent solutions will be acceptable if the AHJ 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.

A.1.5.A NFPA 101A is a technical standard for evaluating equivalency to certain NFPA 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. The FSES is not intended to be used for new construction.

1.5.B (Not Used)

1.5.C Codes and standards which have been referenced in whole, or in part, in the various sections of this document are listed in Appendix A. Names and addresses of originators are also included for information. The issues available at the time of publication are used. Later issues, if used in their entirety, will normally be acceptable where requirements for function and safety are not reduced; however, editions of different dates may have portions renumbered or re-titled. Care must be taken to insure that appropriate sections are used.

1.6 Health Insurance Portability and Accountability Act (HIPAA)

The Health Insurance Portability and Accountability Act (HIPAA) was passed by Congress in 1996. Final modifications to the Privacy Rule were issued in 2002. HIPAA Security and Privacy requirements mandate that operational and physical means be implemented to maintain privacy of

protected health information in any form. Facilities shall be designed to support the confidentiality of protected health information in any of its forms or means including paper records, electronic records, and speech privacy.

A.1.6

Health care providers should have in place appropriate administrative, technical, and physical safeguards to protect the privacy of protected health information. This standard requires that healthcare providers make reasonable efforts to prevent uses and disclosures not permitted by the Rule. Facility restructuring is not deemed to be a requirement under this standard.

Health care providers must implement reasonable safeguards to limit incidental, and avoid prohibited, uses and disclosures. The Privacy Rule does not require that all risk of protected health information disclosure be eliminated. Healthcare providers must review their own practices and determine what steps are reasonable to safeguard their patient information. In determining what is reasonable, providers should assess potential risks to patient privacy, as well as consider such issues as the potential effects on patient care, and any administrative or financial burden to be incurred from implementing particular safeguards. Providers also may take into consideration the steps that other prudent health care and health information professionals are taking to protect patient privacy.

Operational protocols to maintain patient privacy must be coordinated with facility and system design.

Examples of the types of design elements of facilities or systems that may constitute reasonable safeguards for oral privacy are:

- a. The use of sound absorbent materials with high STC (sound transmission coefficient) ratings for ceilings, walls/partitions, and floors.
- b. Partial to full enclosure of key patient encounter spaces.
- c. In an area where multiple patient-staff communications routinely occur, use of cubicles, dividers, shields, curtains, or similar barriers may constitute a reasonable safeguard. For example, a large clinic intake area may reasonably use cubicles or shield-type dividers, rather than separate rooms, or providers could add curtains or screens to areas where discussions often occur between doctors and patients or among professionals treating the patient.
- d. The use of acoustic boots in ductwork serving multiple rooms.
- e. The use of electronic sound masking systems.

Examples of the types of design elements of facilities or systems that may constitute reasonable safeguards for visual privacy of paper or electronic displays are:

- a. Corridor charting stations with self closing doors.
- b. Locking of areas containing patient files.
- c. Positioning of electronic display devices to avoid casual observance along with activation of display screen security after short periods of inactivity.

1.7 Facility conversions

All the requirements of these standards shall be applied to the conversion of an existing unlicensed facility.

All the requirements of these standards shall apply to the conversion of an existing licensed facility of less acuity to one of higher acuity, including but not limited to freestanding surgical outpatient facility to hospital, nursing home to hospital, home for the aged to nursing home, or adult foster care to nursing home.

These standards; except for the window, day/dining, and accessibility requirements of these standards; shall not be applied to the conversion of an existing licensed facility from higher to lesser acuity.

1.8 Certificate of Need

Projects shall comply with any required and applicable Certificate of Need approval letters as per Part 222 of the P.A. 368 as amended (the Public Health Code).

2 DEFINITIONS

2.1 Handwashing Facilities

2.1.A Fixture design:

2.1.A1 Handwashing facilities shall provide the discharge point at least 10 inches above the bottom of the basin. The area (width x length) of the basin shall not be less than 144 square inches, with a minimum 9 inch width or length. The basin shall be sized to accommodate any splash configuration generated by the faucet outlet. Each basin shall be equipped with hot and cold water with controls designed to can be operated without the use of hands. Where wrist blades are provided, they shall be at least 4 inches in length.

2.1.A2 Handwashing basins/countertops may be made of porcelain, stainless steel, or solid surface materials. If the basins are set into plastic laminate countertops, at a minimum the substrate shall be marine-grade plywood with an impervious seal.

2.1.A3 Handwashing facilities shall be located at least 36 inches from patients or storage of clean/sterile materials or shall be equipped with splash guards so as to avoid splash contamination.

2.1.A4 Handwashing facilities shall include liquid or foam soap dispensers and disposable hand towel dispensers. Hand towel dispensers shall function by touching only the toweling being dispensed by pulling down or horizontally. Blown air hand dryers are prohibited.

2.1.A5 Handwashing facilities and lavatories shall be securely anchored to withstand an applied vertical load of not less than 250 pounds on the fixture front.

2.1.A6 Handwashing facilities shall be provided at all locations where invasive patient activities may take place, where product protection is necessary, and where individuals may need to minimize hazards from chemical or microbial exposure.

2.1.A7 Handwashing facilities where required in 2.1.A shall be capable of functioning during the loss of normal power.

2.1.B Handwashing facilities shall be provided in, though not limited to, the following areas:

- 2.1.B1 In addition to work sinks where food is being prepared. A separate sink is not required where only food dispensing functions occur such as in small nourishment stations on nursing units.
- 2.1.B2 In addition to work sinks in soiled utility, sub-sterile, anesthesia work, flash sterilization, or decontamination rooms.
- 2.1.B3 Laboratories where chemical or microbial materials may be present.
- 2.1.B4 Areas where staff have direct physical contact with patients (except in operating rooms and delivery rooms).
- 2.1.B5 Areas or rooms where staff perform an invasive activity, such as drawing blood, or starting an IV.
- 2.1.B6 Areas or rooms where clean or sterile items may be set up or manipulated.
- 2.1.B7 Pharmacies and medicine preparation rooms.
- 2.1.B8 Resident and patient dining rooms.
- 2.1.B9 Resident and patient rooms.
- 2.1.B10 Handwashing facilities serving MRI scanner and related technology can be located immediately outside the scan room if patient preparation occurs outside the room.
- 2.1.C** Handwashing facilities shall be conveniently located as follows:
 - 2.1.C1 Within a 15 foot travel distance of all inpatient (including outpatient PACU) bassinets, beds, stretchers, and examination/treatment locations, including patient care areas in Emergency Department.
 - 2.1.C2 Within a 25 foot travel distance of all outpatient chair, stretcher, and examination/treatment locations, where patient care medication/materials are assembled, where food is prepared, or where toxic, potentially infectious, or otherwise hazardous materials are routinely handled.
 - 2.1.C3 Within the room or space specified in section 2.1.B.
 - 2.1.C4 In clear unobstructed areas, not hidden behind cubicle curtains, columns, or doors, or in areas which are used for equipment/material storage.
- 2.1.D** Handwashing facilities shall be provided in toilet rooms serving patient and resident rooms (see 8.2.B4 for exception) but do not have to comply with the requirements of section 2.1.A.
- A.2.1 Proper hand hygiene is the single most important method to prevent hospital infections. Hand hygiene is accomplished by handwashing or use of alcohol based hand rub. According to the Center for Disease Control use of waterless alcohol hand rub does not replace the need for frequent and proper handwashing but is appropriate unless hands are visibly soiled or exposed to body fluids. Refer to pages 15229-15239 of the May 25 rule and regulations of federal register volume 70 for guidance for proper location of waterless alcohol hand rub dispensers.

The most frequently reported reason associated with poor handwashing compliance by health care workers was inconveniently located or insufficient number of sinks. (1) These guidelines are meant to make hand hygiene easy and convenient. The size of the handwashing sink should be configured to allow any person to easily place their hands in the sink, positioned comfortably under the faucet, and allow vigorous hand scrubbing. The sink should be designed to minimize splash outside the sink bowl during handwashing. Too shallow a sink may cause contamination of hands by bacteria residing in the drain. (2) The deeper the sink, the less spray that will go outside the bowl area. Current ANSI Standards (A112.192) require handwash sinks to be a minimum of

15" x 10" x 6 ½". 2000 Michigan barrier Free Design Code (1998 ICC/ANSI A117.1) 606.5 states that sinks must be no more than 6 ½" deep.

The presence of water around handwash sinks has consistently proven to encourage the presence of opportunistic fungi and molds in the substrate materials if the countertops are not properly sealed and maintained.

Integral back splashes eliminate intersections that need to be caulked. Wall hung sinks eliminate the countertops entirely and avoid adjacent areas where water could splash on items laid down while hands are being washed.

Handwashing facilities can have manual valves or be battery operated. If powered through the electrical power system of the building they must to be connected to the emergency power system critical branch.

References:

- (1) CDC Guideline for Hand Hygiene in Health-Care Settings, MMWR 2002/Vol.51/No. RR-16
- (2) Pittet, Didier, 'Improving Adherence to Hand Hygiene Practice: A Multidisciplinary Approach'. Emerging Infectious Diseases, Mar-Apr 2001

2.2 New Construction

"New construction" is defined as creation of new architectural space outside of the confines of existing floors, walls, and roofs.

2.3 Patient Holding Areas

2.3.A Provide the following:

2.3.A1 A minimum of 100 square feet of clear floor area shall be provided per bed or stretcher that is located in a single-bed room.

2.3.A2 A cubicle with minimum of 80 square feet of clear floor area shall be provided with a minimum head wall dimension of 8 feet per bed or stretcher that is located in a multiple-bed room. This clear floor area shall be exclusive of a 44 inch wide access pathway to each cubicle.

2.3.A3 A designated area with minimum of 50 square feet of clear floor area shall be provided per patient chair that is located in a multiple-chair room. This clear floor area shall be exclusive of 44 inch wide access pathway to each chair.

2.3.A4 A minimum of 4 feet shall be provided between beds or stretchers and between an adjacent wall and the side of a bed or stretcher. A minimum of 3 feet shall be provided between patient chairs and between an adjacent wall and the side of a patient chair.

2.3.A5 Provisions for airborne infection isolation shall be determined by the Infection Control Risk Assessment consistent with Section 5.1.

2.3.A6 Cubicle curtains shall be provided at the perimeter of each cubicle to provide visual privacy in a multiple patient room.

2.3.A7 Visual or equivalent medical observation shall be provided from nurse/control station(s) to all post anesthesia care or other similar acuity patients (see section 7.3.A11).

- 2.3.A8 Handwashing facilities shall be provided consistent with Section 2.1.A.
- 2.3.A9 Patient toilet facilities at a ratio of one per eight patient stations, or fraction thereof, shall be provided where patients are ambulatory. These toilet facilities must be accessible without entering a general corridor.
- 2.3.A10 Support spaces shall be provided consistent with Section 2.7 and the operational narrative (see section 7.7.B2).
- 2.3.A11 Staff toilet facilities shall be provided convenient to the area.
- 2.3.A12 The holding area shall be designed to allow for routine movement of patients and equipment without infringing on the individual cubicles or designated areas.
- A.2.3 Various examination, preparation, holding, treatment, and recovery spaces should be designed to allow for routine travel of attended patients beyond the defined cubicle sizes. Where curtains are used cubicles should be designed to allow staff to freely move around the patient without going beyond the cubicle while maximizing the dimension across the head of the patient. Other than for hemodialysis, cubicle curtains are typically not required at chair stations unless indicated by the operational narrative. Designs should strive to maximize self-sufficiency with a maximum visibility of patients by staff and minimum travel distances. Consideration should be given to adjusting cubicle sizes to account for layout constraints and patient acuity.

2.4 Renovation

Renovation means any change of walls or partitions within an existing building to create a new architectural configuration or a modification to the mechanical, electrical, or plumbing system that significantly changes the design, routing or capacity of the system. Items of normal building maintenance, repair, upkeep, or replacement with similar equipment are not considered renovation. Renovation of 50 percent or more of a department, floor, wing or building will require the entire department, floor, wing or building to meet these standards.

2.5 Equipment Installation

2.5.A Equipment, unless readily movable, shall be:

- a. Sealed to the floor;
- b. Installed on a raised platform in a way that meets all the requirements for sealing or floor clearance; or
- c. Elevated on legs, mounted on walls, or suspended from the ceiling, to provide at least a 6-inch clearance between the floor and the equipment.

2.5.B Equipment is readily movable if:

- a. It is mounted on wheels or casters; and
- b. It has no utility connection or has a utility connection that disconnects quickly, or has a flexible utility line of sufficient length to permit the equipment to be moved for easy cleaning.
- c. It is suspended on a wall by brackets and can be lifted off of the wall by a device, which can be operated by housekeeping personnel for cleaning purposes.

- 2.5.C** Unless sufficient space is provided for easy cleaning between, behind and above each unit of fixed equipment, the space between it and adjoining equipment units and adjacent walls or ceilings shall be not more than 1/32 inch; or if exposed to seepage (or contamination), the equipment shall be sealed to the adjoining equipment or adjacent walls or ceilings.

2.6 Ventilation Requirements for Isolation Rooms

See Section 5.1.A for Infection Control requirements and Table 2A (including footnotes).

2.7 Service Areas

The services listed below shall be provided in each nursing unit. As described in the operational narrative the services listed below shall also be provided in all diagnostic and treatment departments. These services shall be in or readily available to each patient module. The size and location of each service area will depend upon the numbers and types of patients served. Identifiable spaces are required for each of the indicated functions. Each service area may be arranged and located to serve more than one patient module but, unless noted otherwise, at least one such service area shall be provided on each nursing unit. Where the words “room” or “office” are used, a separate, enclosed space for the named function is intended; otherwise, the described area may be a specific space in another room or common area.

2.7.A Administrative center or nurse station

- A.2.7.A It may be combined with or include centers for reception and communication. The station should permit visual observation of all traffic into the unit.

2.7.B Toilet room(s) conveniently located for staff use (may be unisex). A staff toilet room shall be provided on each nursing floor.

- A.2.7.B Staff toilet rooms may be shared between departments and/or nursing units.

2.7.C Securable closets or cabinet compartments for the personal articles of unit staff located in or near the nurse station, staff workroom, or lounge. At a minimum, these shall be large enough for purses and billfolds.

- A.2.7.C Outerwear may be stored in secured closets or cabinets on each floor or in a central staff locker area.

2.7.D Multipurpose room(s) for staff, patients, and patients’ families for patient conferences, reports, education, training sessions, and consultation. These rooms shall be convenient to each nursing unit and clinical department.

- A.2.7.D Multipurpose rooms may be on other floors if convenient for regular use. One such room may serve several nursing units and/or departments. If properly designed, this room can also serve to fulfill the requirements for a staff lounge as per 2.7.U.

2.7.E Examination/treatment room(s). These rooms shall have a minimum clear floor area of 120 square feet and provide a minimum 36 inch clearance on three sides of the table/stretcher. The minimum clear floor area for examination/treatment rooms used exclusively for outpatients shall be permitted to be reduced to 100 square feet.

- A.2.7.E Examination/treatment 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. They may be located on other floors if convenient for regular use.

- 2.7.F** A clean utility shall be provided that contains handwashing facilities, work counter, and storage facilities for clean and sterile supplies. It shall have no direct access to soiled utility or soiled holding rooms.
- Where the operational narrative describes only storage of clean and sterile supplies, the handwashing facilities and work counter shall be permitted to be omitted.
- 2.7.G** A soiled utility room shall be provided that contains handwashing facilities, space for separate covered containers for soiled linen and trash, a two-compartment sink with drain boards, and flushing rim clinical sink. It shall have no direct access to clean utility or storage rooms.
- Where the operational narrative describes only holding of soiled linen and/or waste the two-compartment sink with drain boards and flushing rim clinical sink shall be permitted to be omitted.
- 2.7.H** 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, 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.
- 2.7.I** Clean linen storage. Each nursing unit shall contain a designated area for clean linen storage. This shall be permitted to be within the clean workroom, a separate closet, or an approved distribution system on each floor.
- 2.7.J** 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.
- 2.7.K** Ice machine. Each nursing unit shall have equipment to provide ice for treatments and nourishment. Ice intended for human consumption shall be from self-dispensing ice makers.
- A.2.7.K **Ice-making equipment should be in the clean work room/holding room or at the nourishment station.**
- 2.7.L** Equipment storage room. Appropriate room(s) shall be provided for storage of equipment necessary for patient care and as required by the operational narrative.
- A.2.7.L **This room may serve more than one unit on the same floor.**
- 2.7.M** Storage space for stretchers and wheelchairs shall be provided in a location that does not restrict normal foot traffic.
- 2.7.N** Central 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 may be on a separate floor, if convenient for use. Each bathtub or shower shall be in an individual room or enclosure that provides privacy for bathing, drying, and dressing. A patient toilet room shall

communicate directly to each central bathing facility. Provisions shall be made for storage of soap, towels, and other supplies within these facilities.

- 2.7.O** Additional patient toilet room(s), shall be conveniently located to multipurpose room(s).
- A.2.7.O Patient toilet rooms may be unisex. Patient toilet rooms serving multipurpose rooms may also be designated for public use.
- 2.7.P** 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 that is convenient for the nursing staff, but out of normal traffic, as described in the operational narrative.
- 2.7.Q** Housekeeping room. A housekeeping room shall be provided convenient to each nursing unit or departmental unit. It shall be readily accessible from the unit and be located on the same floor. It shall contain a service sink or floor receptor and provisions for all routinely used supplies and housekeeping equipment.
- 2.7.R.** Dictation. An area with a work surface separate from the nurse station shall be provided.
- 2.7.S** Nurse or supervisor office(s).
- 2.7.T** Charting function consistent with the operational narrative. If provided wall charting/storage units shall be permanently mounted, self-closing, and extend no more than 4 inches into the corridor when closed. Charting units shall be provided with artificial illumination as per Table 8.
- A.2.7.T The 1997 version of NFPA 101 section 5.3.2. allows a maximum projection of 3.5 inches into each side of the required width of the means of egress.
- 2.7.U** Readily accessible staff lounge facilities shall be provided.
- A.2.7.U One such room may serve several nursing units and/or departments.
- 2.7.V** Bathtubs or showers shall be provided at a ratio of one facility for each 12 chemical dependency patients not otherwise served by bathing facilities attached to 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 provide access to handwashing and toilet facilities without entering the corridor.
- 2.7.W** A minimum of 15 s.f. of day/dining floor space per licensed long term acute care and chemical dependency bed shall be provided for day/dining activities within the nursing unit. Windows shall be provided consistent with section 7.28.A10.
- 2.8 Surgical Recovery Units**
- 2.8.A** Post Anesthesia Care (or Phase/Stage 1 Recovery) Unit means a room or ward where the patient transitions from a totally anesthetized state to one requiring less acute interventions. Prior to discharge from this unit, the patient has been fully stabilized.
- 2.8.B** Phase/Stage 2 Recovery Unit means a room or ward where outpatients prepare to care for themselves or to be cared for in an extended care facility.

2.9 Nursing Unit

Nursing Unit is defined as a patient care area of a facility, which includes patient sleeping rooms, support areas, and staff areas. A nursing unit is limited to one floor and/or wing of a building. The nursing unit includes one or more patient modules.

2.10 Patient Module

Patient Module are defined as a unit of a health care facility made up of one or more patient sleeping rooms which are served from a single staff location.

2.11 Resident Unit

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 operational narrative for the facility.

2.12 Picture Archiving and Communication System (PACS)

Picture Archiving and Communication System (PACS) is an electronic means for acquiring, storing, transmitting, and viewing images permitted to replace film media. However unless justified in the operational narrative, accommodation for older or outside films is still required. As image viewing is normally associated with surgical, emergent, or critical care, the PACS shall be served by emergency power.

3 SITE

3.1 Location

3.1.A (Not Used)

3.1.B (Not Used)

A.3.1.B Facilities should be located so that they are convenient to public transportation, where available, unless acceptable alternate methods of transportation to public facilities and services are provided.

3.1.C (Not Used)

3.1.D Availability of Utilities

Facilities shall be located to provide reliable community utilities (water, gas, sewer, electricity). The water supply shall have the capacity to provide normal usage plus fire-fighting requirements. At least two service lines shall be provided to the facility. The water service lines shall be fed from a looped municipal system and valved so that water will continue to be provided to the hospital in the event of disruption of the water line on one side of the valve. The electricity shall be of stable voltage and frequency.

Nursing homes, freestanding surgical outpatient, and freestanding dialysis facilities are only required to have a single source of potable water.

When a public sanitary sewage system is not available and a private liquid wastewater disposal system is used, the system shall be approved by the department and shall comply with all applicable laws.

A subsurface disposal system (septic tank and tile field) is not acceptable.

- A.3.1.D **Underground utilities should be located sufficiently remote enough from one another such that a disruptive incident to one would not be anticipated to affect the others.**

3.2 Facility Site Design

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 shall not conflict with access to the emergency service. 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.

3.3 Environmental Pollution Control

- A.3.3 **Facilities must comply with local, state, and federal environmental regulations. Permits for various discharges may be required. Means should also be provided to allow for secured holding of multiple recyclable waste streams.**

4 EQUIPMENT

4.1 General

- 4.1.A** (Not Used)

- 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.

- A.4.1.B **Design should consider the placement of cables from portable equipment so that circulation and safety are maintained.**

- 4.1.C** Space for accessing and servicing fixed and building service equipment shall be provided in accordance with manufacturers recommendations.

- 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 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 Non-medical)

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 non-medical 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 Non-medical)

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 monitoring equipment. Movable equipment may require special structural design, 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 non-medical equipment includes, but is not limited to, personal computer stations, patient room furnishings, food service carts, case carts and distribution carts, and other portable equipment.

4.3 Major Technical Equipment

Major technical equipment is specialized equipment (medical or non-medical) 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.

A.4.3 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.

4.4 Electronic Equipment

Evaluation shall be made to protecting computerized equipment such as multiphasic laboratory testing units, as well as computers, from power aberrations 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.

A.4.4 Even a very short-term loss of electrical power can endanger patients during invasive or emergency procedures such as cardiac catheterizations, C.T. scans of trauma victims and result in the loss of vital electronic medical data.

5 PLANNING, DESIGN, AND CONSTRUCTION

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, excessive noise/vibration, and protection of patients during construction.

5.1 Infection Control in Planning and Design

An infection control risk assessment (ICRA) is a determination made during the planning phase of the project of the potential risk of transmission of various air and waterborne biological contaminants in the facility, identification of patients who are severely immunosuppressed, and guidance to mitigate cross transmission of disease based on the associated epidemiology. The ICRA shall consist of, but be limited to, the following:

5.1.A The ICRA shall be conducted by a panel with expertise in infection control, risk management, facility design, construction and construction phasing, direct patient care, 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 owner shall provide for the monitoring of the effectiveness of the applied protocols during the course of the project.

A.5.1.A The multidisciplinary group performing the infection control risk assessment should involve at least the health system's epidemiology/infection control department, the infection control committee (or committee charged with development and review of the infection control policy) and administrators representing special program needs. The assessment is primarily based on the population served and the programs and services provided. The assessment is performed in the early conceptual design phase to protect patients and avoid disruption of essential patient services. The risk assessment should also consider the health system needs for managing patients with communicable disease (e.g., TB, Varicella, infections with resistant organisms) and patients who are severely immunosuppressed (e.g., bone marrow transplant recipients).

5.1.B Building design features shall be addressed when developing the ICRA:

5.1.B1 Number, location, and type of airborne infection isolation and protective environment rooms.

5.1.B2 Location(s) of special ventilation and filtration such as emergency department waiting and intake areas.

5.1.B3 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.

5.1.B4 Water systems to limit Legionella and waterborne opportunistic pathogens.

5.1.B5 Appropriate finishes and surfaces.

A.5.1.B 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. These areas should be recognized as needing mechanical systems that comply with infection control and/or laboratory safety requirements.

- 5.1.C** Building and site areas anticipated to be affected by construction shall be addressed when developing the ICRA:
- 5.1.C1 The impact of disrupting essential services to patients and employees.
 - 5.1.C2 Determination of the specific hazards and protection levels for each.
 - 5.1.C3 Location of patients by susceptibility to infection and definition of risks to each.
 - 5.1.C4 Impact of potential outages or emergencies and protection of patients during planned or unplanned outages.
 - 5.1.C5 Movement of debris, traffic flow, cleanup, and testing and certification.
 - 5.1.C6 Assessment of external as well as internal construction activities.
 - 5.1.C7 Location of known hazards.
- 5.1.D** Infection control risk mitigation protocols shall be prepared by the ICRA panel and shall address, but not be limited to, the following:
- 5.1.D1 Patient placement and relocation
 - 5.1.D2 Standards for barriers and other protective measures required to protect adjacent areas and susceptible patients from airborne contaminants.
 - 5.1.D3 Temporary provisions or phasing for construction or modification of heating, ventilating, air conditioning, and water supply systems
 - 5.1.D4 Protection from demolition
 - 5.1.D5 Measures to be taken to train hospital staff, visitors, and construction personnel.
 - 5.1.D6 The owner shall ensure that construction-related requirements of the protocols, as well as ICRA-generated design requirements, are incorporated into the project requirements.
 - 5.1.D7 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).
- A.5.1.D Partitions and enclosures around renovation areas should be solid in nature, securely attached, and sealed at the floor and structure above, unless the scope of the work is very limited. Where life safety does not warrant special constructions, measures should still 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 locations of fresh air intakes and filters (where necessary), as well as the disconnection of existing air ducts, as required.

5.2 Phasing

Projects involving renovation of existing buildings shall include phasing to minimize disruption of existing patient services. All essential care related functions and facilities including nurse station, clean utility, soiled utility, medication dispensing, assisted bathing, emergency equipment storage, housekeeping, and dining with required exterior window glass, shall be maintained throughout the project. This phasing is essential to ensure a safe environment in patient care areas. Phasing shall include:

- 5.2.A Assurance for clean to dirty airflow
- 5.2.B Emergency procedures
- 5.2.C Criteria for interruption of services
- 5.2.D Construction of roof surfaces
- 5.2.E Written notification of interruptions
- 5.2.F Communication authority
- 5.2.G Control of noise and vibration
- 5.2.H The renovation areas shall be isolated from the occupied areas during construction using smoke tight barriers, which meet the requirements of the Michigan Department of Labor and Economic Growth, Bureau of Fire Services.
- 5.2.I Exhaust airflow shall be sufficient to maintain negative air pressure in the construction zone. Air quality requirements shall be maintained as described in Tables 2 and 6.
- 5.2.J All such precautions shall be described in the operational narrative.

5.3 Commissioning

Operational and performance testing shall be performed prior to building occupancy to ensure that the systems and equipment function as per the design intent. Building components, mechanical, plumbing, various electrical, and control/monitoring systems shall be included as well as integration of these systems with owner provided systems. Critical functions, such as switching between normal and alternative power sources, shall be verified before occupancy. Acceptance criteria and the methods to measure shall be specified in the design of all critical systems. Air balance testing of HVAC systems shall be performed under design conditions with simulation of fully loaded filters. Filters shall be replaced at the conclusion of testing.

- A.5.3. 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. Consideration should be given to have commissioning performed by an entity that is independent from the installing contractor and design engineers.

Proper commissioning improves energy efficiency, encourages overall collaboration during design, reduces change orders, uncovers problems earlier, reduces down time, allows for facility staff training, provides documentation, and addresses facility management concerns both during construction and after turnover.

Commissioning was originally developed to improve the functionality of mechanical systems (mainly HVAC). Resources available to assist in understanding commissioning needs for these types of systems including ASHRAE Guideline 1-1996 – “The HVAC Commissioning Process” and the Michigan Energy Code which requires commissioning for energy related systems.

When an emergency or alternate source electrical power is required, during times when the normal electrical service is interrupted, all operational phases of the electrical system (normal, alternate, and transitional) should be tested. The commissioning process must include testing that will verify that the loads supplied by alternate source work together and sustain a safe environment for patients and staff. The interdependency of complex systems and their controls must be successfully tested to prove that during a utility power outage the alternate source of power for essential electrical system, and the loads it supplies, will be functional. The commissioning process must provide a detailed testing procedure, including record documentation that the test was successfully completed. The testing procedure should prove that a safe transition, back and forth, between normal and emergency power can be made. When automatic transition is required for supporting critical procedures the transitioning sequence should be proven to be effective during the testing procedure. Uninterruptible Power Sources (UPS) are often used for critical loads that cannot tolerate even a momentary power interruption. The effectiveness of UPS should be verified under load, and under conditions that simulate the loss and restoration of power. Where practical the load used for testing should be the equipment requiring protection.

The Commissioning Process does not substitute for full development of proper design.

5.4 Existing Conditions

Existing conditions and operations shall be documented prior to initiation of renovation and/or new construction projects, including the existing mechanical/electrical capacities and quantities.

If any of the following utilities will be affected, it is good engineering practice that existing capacities and conditions be investigated and documented.

A.5.4. Documentation of existing conditions should include:

- a. Subsurface conditions (including soil testing reports, soil types, known water table information, active/abandoned utility locations).
- b. Foundation and superstructure information, including the structure/equipment’s (elevator) ability to handle the movement of heavy/large loads from one location to another.
- c. Fire suppression, detection, and alarm systems and construction type and if 100% sprinklered.
- d. Various communications systems (including telephone, nurse call, overhead paging, telemetry, dictation, electronic imaging).
- e. Various plumbing systems (including domestic water, hydronics, treated water, wastewater, pneumatic tube, pneumatic controls, medical gases/vacuum).
- f. Existing airflow of affected areas.
- g. Main Electrical Service and electrical service affected by construction .

Rating

- Actual Load (Peak) and Feeder Sizes as applicable
- Power factor

- h. Emergency Power System
 - Rating
 - Life Safety Branch
 - Emergency / Critical Branch
 - Equipment Branch
 - Actual Load (Peak) and Feeder Sizes as applicable
 - Life Safety Branch
 - Emergency / Critical Branch
 - Equipment Branch

5.5 Occupancy Approval

Construction or renovation of a health care facility, or any phase of which, that involves patient care shall not be occupied prior to the AHJ conducting an opening survey and issuing occupancy approval.

- A.5.5 Refer to “Healthcare Facility Projects: Project Planning to Opening Survey Recommendations”, publication BHS/ HFS-554, for an explanation of what the opening survey consists of and a listing of required opening survey documentation.

6 RECORD DRAWINGS AND MANUALS

6.1 Drawings

- 6.1.A Drawings shall include a life safety/fire protection plan for each floor reflecting NFPA 101 and other applicable fire and construction code compliance. The life safety/fire protection plan shall show standpipes, fire extinguishers, smoke compartments, fire areas, means of egress, and exits. Fire resistance ratings of walls shall be shown. The codes applicable during the project design shall be listed on each set of contract documents.

- 6.1.B Upon completion of the contract, the owner shall be furnished with a complete set of the following:

- a. As-built drawings that include civil, structural, architectural, mechanical, electrical, and plumbing trades.
- b. All shop drawings

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

7.1 General Considerations

7.1.A There shall be for each project an operational narrative for the facility consistent with Section 1.1.C.

7.1.B The general hospital shall meet all the standards described herein. Deviations shall be described and justified in the operational narrative for specific approval by the AHJ.

A.7.1.B Hospitals are also governed under licensing rules promulgated via the authority of section 20171 of the P.A. 368 (the Public Health Code) and federal certification requirements under Title 42, Chapter IV, subchapter E, Part 482 of the Code of Federal Regulations.

7.1.C Department size and clear floor areas will depend upon 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 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 at any given time. Additional parking shall 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 (Not Used)

A.7.1.E When the concept of swing beds is part of the operational narrative, care should be taken to include requirements for all intended categories. 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.

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 1.2 for waiver of standards where existing conditions make absolute compliance impractical).

7.2.A Each patient room shall meet the following standards.

7.2.A1 Maximum room capacity shall be two patients. Where renovation work is undertaken and the present capacity is more than two patients, maximum room capacity shall be no more than the present capacity with a maximum of four patients.

A.7.2.A1 Research continues into the advantages and disadvantages of private rooms. Bed utilization, disease control, medical errors, patient dignity, and supportive healing environments all benefit from use of private rooms. However space limitations as well as increased patient falls, construction costs, and travel distances represent the downside of requiring all private rooms.

7.2.A2 Patient rooms shall have a minimum of 100 square feet of clear floor area per bed in multiple-bed rooms and 120 square feet 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 of 3 feet 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 shall be available at the foot of each bed to permit the passage of equipment and beds. Minor encroachments, including columns and lavatories, 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 square-foot standards, the AHJ may grant approval to deviate from this requirement. In such cases, patient rooms shall have no less than 80 square feet of clear floor area per bed in multiple-bed areas and 100 square feet of clear floor area in single-bed rooms.

- A.7.2.A2 These areas are recognized as minimums and do not prohibit the use of larger rooms, where required, for needs and functions. The acuity of care being provided should be the determining factor.
- 7.2.A3 Each patient room shall have a window consistent with Section 7.28.A10.
- A.7.2.A3 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.
- 7.2.A4 (Not Used)
- A.7.2.A4 There has been increased interest in designs to accommodate obese patients. In such facilities it is recommended that the rooms, furniture, fixtures, and accessories be designed for 1,000 pound loads as well as additional clearances. Wider wheelchairs and staff assistance on both sides of the patient using the water closet should be considered. Use of a freestanding grab bar can allow for such access while satisfying safety requirements. Consideration should be given for overhead patient transfer from/to bed, tub, water closet, and examination table.
- 7.2.A5 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 facility.
- 7.2.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.
- 7.2.A7 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, or toilet room.
- 7.2.B** Service Areas shall be provided consistent with the requirements of Section 2.7.
- 7.2.C** Airborne Infection Isolation Room(s)
- A.7.2.C Refer to section 7.31D and Table 2A for ventilation requirements. If UVGI lights are used, the minimum ceiling height should be 9 feet.
- The number of airborne infection isolation room requirements contained in these standards for particular service areas throughout a facility should be predicated on an "infection control risk assessment" and based on the needs of specific community and patient populations served by an individual organization. This process ensures a more accurate determination of environmentally safe and appropriate room types and spatial needs. It is suggested that reference be made to the Center for Disease Control and Prevention (CDC) publications: (www.cdc.gov)
- a. "Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Settings," 2005, MMWR 2005;54 (No. RR-17): 1-141 Refer to <http://www.cdc.gov/mmwrhtml/rr5417a1.htm>.

b. "Guidelines for Preventing Health-Care-Associated Pneumonia", 2003 recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC); MMWR March 26, 2004/53 (RR03); 1-36 See http://www.cdc.gov/ncidod/dhqp/gl_hcpneumonia.html "

c. "Guideline for Environmental Infection Control in Health-Care Facilities" 2003 joint recommendations from CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). See <http://www.cdc.gov/ncidod/hip/enviro/guide.htm>

Other useful references include 1) ASHRAE Standard 62-1989R "Ventilation for acceptable Indoor Air Quality" and 2) MiOSHA Division Instruction GISHD COM-05-2, dated July 11, 2005.

7.2.C1 At least one airborne infection isolation room shall be provided. The number of airborne infection isolation rooms for individual patient units shall be increased based upon an "infection control risk assessment" prepared by a multidisciplinary group designated for that purpose. 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 exfiltrate from the room into the surrounding environment or other spaces.

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

A.7.2.C4 An exception may be allowed for sliding doors in ICUs where a separate anteroom is provided.

7.2.C5 Separate water closet, bathtub (or shower), and handwashing facilities are required for each airborne infection isolation room.

7.2.C6 (Not Used)

7.2.D Protective Environment Room(s)

A.7.2.D Facilities with protective environment rooms should include at least one immunosuppressed host airborne infection isolation room. 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. Air flows from the anteroom, to the patient room and the corridor, or

b. Air flows 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.

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 HEPA filters (MERV 17). When determined by an infection control risk assessment, special design considerations and air ventilation to ensure the protection of patients with these conditions should be required. The appropriate numbers and location of protective environment rooms should be determined by the infection control risk assessment. Protective environment room(s) should contain only one bed and comply with Section 7.2.C. Special ventilation requirements are found in Table 2. Also, see special guidelines for protective environment rooms during renovation and construction in Section 5.1.

As designated by the operational narrative, both airborne infection isolation and protective environment rooms may be required. 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. These requirements should be incorporated in design programming.

- 7.2.D1 The protective environment room(s), if designated by the operational narrative, shall be provided for patients with extreme susceptibility to infection; (e.g., bone marrow recipients and similarly vulnerable patients). The appropriate number and location of protective environment rooms shall be determined based upon an “infection control risk assessment” prepared by a multidisciplinary group designate for this purpose. Each room shall contain only one bed and shall comply with the acute-care patient room section in this document, as well as the following.
- 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 directly accessible from each protective environment room.
- A.7.2.D5 See the “CDC Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities, 2005”
- 7.2.D6 Rooms shall have a permanently installed visual mechanism to constantly monitor the air 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 Air distribution pattern within the protective environment rooms(s) shall be arranged so that the return/exhaust grilles or registers are located near the patient room door and remote from the supply air diffusers.
- A.7.2.D7 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 scrub sink 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.

Patients should be housed in single-bedded rooms with full-height partitions, sealed tightly so that air does not infiltrate from the corridor into the room to prevent cross-infections. All surfaces, floors, walls, ceilings, doors, windows, and curtains should be scrubbable.

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 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. If an alarm is installed, allowances should be made to prevent nuisance alarms of monitoring devices.

- 7.2.E** The hospital shall provide one or more single-bed rooms for patients needing close supervision for medical and/or psychiatric care. If the single-bed room(s) is part of the acute-care nursing unit, the provisions of Section 7.6.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 insure patient privacy and prevent casual observation by visitors and other patients.

7.3 Critical Care Units

- A.7.3 The critical care units require special space and equipment considerations for effective staff functions. 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 operational narrative. The following standards are intended for the more common types of critical care services and shall be appropriate to needs defined in the operational narrative. Where specialized services are required, additions and/or modifications shall be made as necessary for efficient, safe, and effective patient care.

7.3.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.A1 The location shall be arranged to eliminate the need for through traffic.

- 7.3.A2 In new construction, where elevator transport is required for critically ill patients, the size of the cab and mechanisms and controls shall meet the specialized needs.

- A.7.3.A2 Transportation of patients to and from the critical care unit should ideally be separated from public corridors and visitor waiting areas.

7.3.A3 Each patient space (whether separate rooms, cubicles, or multiple bed space) shall have a minimum of 150 square feet of clear floor area with a minimum headwall width of 12 feet per bed, exclusive of anterooms, vestibules, toilet rooms, closets, lockers, wardrobes, and/or alcoves.

The dimensions and arrangement of rooms shall be such that there is a minimum 4 feet between the sides and foot of the bed and any wall or any other fixed obstruction. Minor encroachments, including columns and lavatories, that do not interfere with functions may be ignored when determining space requirements for patient rooms

A.7.3.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.

7.3.A4 When private rooms or cubicles are provided, view panels to the corridor shall be required and shall have drapes or curtains which may be closed. The door opening to a bed space shall be at least 4 feet wide and arranged to minimize interference with movement of beds and large equipment. Sliding doors shall not have floor tracks and shall have hardware that minimizes jamming possibilities.

7.3.A5 Each patient bed area shall have space at each bedside for visitors, and 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 between beds.

7.3.A6 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. When partitioned cubicles are used, patients view to outside windows may be through no more than two separate clear vision panels.

7.3.A7 (Not Used)

7.3.A8 (Not Used)

7.3.A9 Service areas shall be provided within the critical care suite consistent with the requirements of Section 2.7 and the operational narrative, except that the equipment storage room shall not serve other nursing units or departments.

A.7.3.A9 To minimize distraction of those preparing medications, the area should be enclosed. A glass wall or walls may be advisable to permit visualization 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.

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. Suitable space ergonomically designed is especially germane where computers are used for the clinical record.

Appropriate room(s) should be provided for storage of large items of equipment necessary for patient care and as required by the functional program. Its 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 readily accessible.

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 electrical outlets should be provided in sufficient numbers to permit recharging stored battery-operated equipment.

- 7.3.A10 Each unit shall contain equipment for continuous monitoring of vital signs, 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.
- 7.3.A11 (Not Used)
- A.7.3.A11 Intensive Care patients should be observed at all times. This can be addressed in a variety of ways such as by remote electronic monitoring of vital signs with displays that is staffed and can report back to the direct caregiver, a centrally located nurse station that provides line of sight monitoring, or decentralized nurse work stations that allow visual contact of each patient from the work stations or any assigned patient bedside.
- 7.3.A12. (Not Used)
- 7.3.A13. (Not Used)
- 7.3.A14. At least one airborne infection isolation room shall be provided consistent with the requirements of Section 7.2.C., except that a separate bathtub or shower is not required.
- 7.3.A15. Provisions for X-ray film or PACS viewing shall be made in the unit.
- 7.3.A16. Service areas consistent with the requirements of Sections 2.7.B, 2.7.D, 2.7.M, and 2.7.Q, and those areas listed below shall be provided and may be located outside the unit, if conveniently accessible.
- a. A visitors' waiting room shall be provided with convenient access to telephones and toilet rooms. One waiting room may serve several critical care units.
 - b. Adequate office space immediately adjacent to the critical care unit shall be available for critical care medical and nursing management/ administrative personnel. The offices shall be large enough to permit consulting with members of the critical care team and visitors. The offices shall be linked with the unit by telephone or an intercommunications system.
 - c. Staff lounge(s) 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. One lounge may serve adjacent critical care areas.

- d. A special procedures room shall be provided if required by the operational narrative. The room shall have a minimum clear floor area of 150 square feet, exclusive of any fixed cabinets or built-in shelves that allows for a minimum 4 foot clearance on three sides of the patient table or stretcher. The room shall include clean supply storage facilities, workcounter, and handwashing facilities as per section 2.1.A. A system for staff emergency communication shall be provided consistent with the requirements of Section 7.32.G4.
- e. Sleeping and personal care accommodations for staff on 24-hour on-call work schedules shall be provided.

7.3.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.A., the following standards apply to the coronary critical care unit.

7.3.B1 Each coronary patient shall have a private room.

7.3.B2 Each coronary patient shall have access to a water closet within the room or in an adjacent toilet room.

7.3.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 shall comply with 7.3.B1 and 7.3.B2.

7.3.D Pediatric Critical Care (see 7.3.A)

7.3.E Newborn Intensive Care Units

Each Newborn Intensive Care Unit (NICU) shall include or comply with the following.

7.3.E1 All entries to the NICU shall be controlled. The family entrance and reception area shall be clearly identified. The area shall permit visual observation and contact with all traffic entering the unit.

7.3.E2. At least one door to each room in the unit shall be large enough to accommodate portable X-ray equipment.

7.3.E3. (Not Used)

7.3.E4. (Not Used)

7.3.E5. (Not Used)

7.3.E6 (Not Used)

A.7.3.E6. General lighting in the nursery should not exceed 100 foot-candles measured at mattress level. Whenever possible, general lighting, as well as supplemental examination lights, should be designed to be controlled from each incubator position. A master switch is also desirable to simultaneously control all lights in special situations.

Ambient lighting levels in newborn intensive care units should be adjustable through a range of at least 1 to 60 foot-candles, as measured at each bedside. Both natural and artificial light sources should have controls that allow immediate darkening of any bed position sufficient for transillumination, when necessary.

Artificial light sources should have a visible spectral distribution similar to that of daylight, but should avoid unnecessary ultraviolet or infrared radiation by the use of appropriate lamps, lenses, or filters.

Separate procedure lighting should be available to each patient care station that provides no more than 150 to 200 foot-candles of illumination of the patient bed. This lighting should minimize shadow and glare; it should be adjustable and highly framed so babies at adjacent bed positions will not experience an increase in illumination.

At least one source of natural light should be visible from patient care areas. External windows in patient care rooms should be glazed with appropriate materials to minimize heat gain or loss, and should be situated at least 2 feet away from any part of a patient bed to minimize radiant heat loss from the baby. All external windows should be equipped with shading devices.

- 7.3.E7. A central area shall serve as a control station, shall have space for counters and storage, and shall have convenient access to handwashing facilities. It may be combined with or include centers for reception and communication and patient monitoring.
- 7.3.E8. Each patient care space shall contain a minimum of 120 square feet of clear floor area per bassinet excluding sinks and aisles. There shall be an aisle adjacent to each infant care space with a minimum width of 4 feet 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 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 between infant care beds. Each patient care space shall be designed to allow privacy for the infant and family. Each NICU room shall contain no more than 12 infant stations.
- 7.3.E9. An airborne infection isolation room is required in at least one level of nursery care (full term, special care, or neonatal intensive care) within the hospital. 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 water closet, bathtub, or shower.
- 7.3.E10. (Not Used)
- 7.3.E11. (Not Used)
- 7.3.E12 (Not Used)
- A.7.3.E12. 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.
- 7.3.E13. (Not Used)
- 7.3.E14. A consultation/demonstration/breast feeding or pump room shall be provided convenient to the unit. Provision shall be made for handwashing facilities, counter, refrigeration and freezing, storage for pump and attachments, and educational materials.
- 7.3.E15. Service areas shall be provided consistent with the requirements of Section 2.7 and the operational narrative. .

- A.7.3.E15 Whenever possible, supplies should flow through special supply entrances from external corridors so that penetration of the unit by non-nursery personnel is unnecessary.
- 7.3.E16. (Not Used)
- 7.3.E17. (Not Used)
- 7.3.E18. (Not Used)
- 7.3.E19. Provide a lounge and locker room within or adjacent to the unit suite for staff use.
- 7.3.E20. (Not Used)
- 7.3.E21. A housekeeping room(s) shall be provided for the unit. It shall be directly accessible from the unit and be dedicated for the exclusive use of the neonatal critical care unit. It shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.
- 7.3.E22. A visitor waiting room shall be provided consistent with the requirements of Section 7.3.A16.a.

7.4 Newborn Nurseries

Normal newborn infants shall be housed in nurseries that comply with the standards below. Location shall be within the obstetrical facilities. The nurseries shall be located and arranged to preclude the need for non-related pedestrian traffic. No nursery shall open directly into another nursery.

- 7.4.A** Each nursery suite shall contain:
 - 7.4.A1 (Not Used)
 - 7.4.A2 Glazed observation windows to permit the viewing of infants from workrooms and adjacent nurseries
 - 7.4.A3 Convenient, accessible storage for linens and infant supplies at each nursery room
 - 7.4.A4 A consultation/demonstration/breast feeding or pump room consistent with the requirements of Section 7.3.E14 and with the operational narrative
 - 7.4.A5 (Not Used)
 - 7.4.A6 An airborne infection isolation room shall be provided consistent with the requirements of Section 7.3.E9.
 - 7.4.A7 Hospitals having 25 or more postpartum beds shall have a separate nursery that provides continuing care for infants requiring close observation (e.g., those with low birth weight). The minimum floor area per infant shall be 50 square feet exclusive of auxiliary work areas, with provisions for at least 4 feet between and at all sides of bassinets. Each nursery room shall contain no more than 16 infant stations.

7.4.B Nursery Capacity

Each full-term nursery room shall contain no more than 16 infant stations. The minimum floor area shall be 30 square feet for each infant station, exclusive of auxiliary work areas, with provisions for at least 3 feet between and at all sides of bassinets.

The full-term nursery shall have a capacity of 110 percent of the number of licensed postpartum beds. When a rooming-in program is used, the total number of bassinets provided in these units

may be appropriately reduced based on adequate justification in the operational narrative, but the full-term nursery shall not be omitted in its entirety from any facility that includes delivery services.

7.4.B1 (Not Used)

7.4.C Charting function consistent with the operational narrative.

7.4.D Workroom(s)

Each nursery room shall be served by a connecting workroom. The workroom shall contain a work counter, refrigerator, and storage for supplies. One workroom may serve more than one nursery room provided that required services are convenient to each. The workroom shall be provided with direct access to the corridor without passing through the nursery rooms.

Adequate provision shall be made for storage of emergency cart(s) and equipment out of traffic flow.

A.7.4.D The workroom functions described above may be incorporated in the nurse station that serves the postpartum patient rooms.

7.4.E Examination/Treatment Room

Provide within the obstetrical service for the examination and treatment of infants. The minimum clear floor area shall be 80 square feet. This room shall contain a work counter, storage facilities, and an examination table or counter. This room shall have direct access to a workroom or to a corridor without passing through the nursery rooms.

7.4.F Provide soiled utility or soiled holding room(s) consistent with the requirements of Section 2.7.G.

7.4.G (Not Used)

7.4.H (Not Used)

7.5 Pediatric and Adolescent Unit

A.7.5 Nursing units with less than 16 pediatric beds are exempt from the requirements of this section as per State of Michigan licensing rule 325.1081(3).

7.5.A Patient Rooms

7.5.A1 Maximum room capacity shall be consistent with the requirements of Section 7.2.A1.

7.5.A2 The space requirements for pediatric patient rooms shall be consistent with the requirements of Section 7.2.A2.

Additional provisions for hygiene, toilets, sleeping, and personal belongings shall be included where the program indicates that parents will be allowed to remain with young children.

7.5.A3 Each patient room shall have a window consistent with Section 7.28.A10.

7.5.A4 At least one airborne infection isolation room shall be provided consistent with the requirements of Section 7.2.C.

7.5.B (Not Used)

7.5.C (Not Used)

- 7.5.D** (Not Used)
- 7.5.E** Examination/treatment room(s) consistent with the requirements of Section 2.7.E shall be provided.
- 7.5.F** The service areas in the pediatric and adolescent nursing units shall conform to Section 2.7 and shall also meet the following standards.
- 7.5.F1 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 operational narrative 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 these multipurpose room(s). Provide a patient toilet room convenient to these rooms.
- 7.5.F2 (Not Used)
- 7.5.F3 (Not Used)
- 7.5.F4 Storage closets or cabinets for toys, educational, and recreational equipment shall be provided.
- 7.5.F5 Storage space shall be provided to permit exchange of cribs and 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.F6 (Not Used)
- 7.5.F7 (Not Used)

7.6 Psychiatric Nursing Unit

When part of a general hospital, these units shall be designed for the care of ambulatory and non-ambulatory inpatients. Provisions shall be made in the design for adapting the area for various types of psychiatric therapies. Details of such facilities should be as described in the operational narrative.

- A.7.6 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 to applicable fire safety codes. Security and safety devices should not be presented in a manner to attract or challenge tampering by patients.

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 to inhibit possible escape or suicide. 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 existing buildings designed with approved, engineered smoke control systems may be of fixed construction. Where glass fragments pose a hazard to certain patients, safety glazing and/or other appropriate security features shall be used.

- 7.6.A** The standard noted in Section 7.2.A. shall apply to patient rooms in psychiatric nursing units, except as follows.
- 7.6.A1 (Not Used)
- 7.6.A2 (Not Used)
- 7.6.A3 (Not Used)
- 7.6.A4 Visual privacy in multi-bed rooms (e.g., cubicle curtains) is not required.
- 7.6.B** Service areas for psychiatric nursing units shall be provided consistent with the requirements of Section 2.7 with the following additions.
- 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).
- 7.6.B2 (Not Used)
- 7.6.B3 Food service within the unit shall 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 storage space, refrigerator, and facilities for meal preparation. The kitchen service shall comply with the requirements of Section 7.18.
- 7.6.B4 Storage space for stretchers and wheelchairs shall be provided. This storage may be outside the psychiatric unit, if provisions are made for convenient access as needed for disabled patients.
- 7.6.B5 A bathtub or shower shall be provided for each six beds or fraction thereof, not otherwise served by bathing facilities within the patient rooms. Bathing facilities shall be designed and located for patient convenience and privacy. Each bathtub or shower shall be in an individual room or enclosure that provides privacy for bathing, drying, and dressing. A patient toilet room shall communicate directly to each central bathing facility.
- 7.6.B6 A separate charting area shall be provided with provision for acoustical privacy.
- A.7.6.B6 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 per patient, with at least 120 square feet for each of the two spaces. This space may be shared by dining activities. Windows shall be provided consistent with section 7.28.A10 based on 30 s.f. per bed of the social space.
- 7.6.B8 Space for group therapy shall be provided. This may be combined with the quiet space noted above, provided there is:
- a. A minimum of 225 feet of enclosed private space available for group therapy activities,
or
 - b. An addition of 8 square feet of activity space per patient to the activity space required in 7.6.B7. (provide a total of 48 square feet per patient.)

- 7.6.B9 Patient laundry facilities with an automatic washer and dryer shall be provided.
- 7.6.B10 (Not Used)
- 7.6.B11 Separate consultation room(s) with a minimum floor space of 100 square feet each, shall be provided at a ratio of one consultation room for each 30 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 shall provide 15 square feet of separate space per patient for occupational therapy, with a minimum total area of at least 200 square feet, whichever is greater. Space shall include provision for handwashing, work counter(s), storage, and displays. Occupational therapy areas may serve more than one nursing unit. When psychiatric nursing unit(s) contains less than 16 beds, the occupational therapy functions may be performed within the noisy activities area, if at least an additional 10 square feet per patient is provided.
- 7.6.B13 A conference and treatment planning room for use by the psychiatric unit shall be provided.
- 7.6.C** Provisions for airborne infection isolation shall be made in the hospital. The total number of infection isolation rooms shall be determined by an infection control risk assessment. Airborne infection isolation room(s) shall comply with the requirements of Section 7.2.C.
- 7.6.D** There shall be at least one seclusion room. The seclusion treatment room is intended for short-term occupancy by a violent 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 one patient. It shall have an area of at least 100 square feet and shall be constructed to prevent patient hiding, escape or injury. Seclusion rooms may be grouped together. Special fixtures and hardware for electrical circuits shall be used. Minimum ceiling height shall be 9 feet. Doors shall be 3 feet 8 inches wide, shall open out, 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 which also provides direct access to a toilet room. The toilet room and anteroom shall be large enough to safely manage the patient. Each seclusion room shall have a window consistent with section 7.28.A10.
- 7.6.E** See Section 11.4 (Details)
- 7.6.F** See Section 11.5 (Finishes)
- 7.6.G** Mechanical systems shall comply with section 8.31 except that the design temperature range for patient occupied rooms shall be designed and maintained to remain between 70 and 75° F.
- 7.6.H** Electrical Standards shall comply with section 7.32 unless noted below:
- 7.6.H1 Panel boards shall not be accessible to patients.
- 7.6.H2 All electrical receptacles in clinical areas shall be safety type or GFI protected.
- 7.6.H3 A nurse call system shall be provided consistent with 7.32.G, except provisions shall be made for easy removal and/or covering of call buttons and call cords shall not exceed 6 inches in length.

7.7 Surgical Suites

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

- 7.7.A** Surgery
- 7.7.A1 General operating room(s). Each room shall have a minimum clear floor area of 400 square feet with a minimum clear dimension of 20 feet exclusive of fixed or wall-mounted cabinets and built-in shelves, and a system for emergency communication with the surgical suite control station. X-ray film illuminators for handling at least four films simultaneously or PACS shall also be provided.
- A.7.7.A1 Where renovation work is undertaken, every effort shall be made to meet the minimum standards. If it is not possible to meet the square-foot standards, the AHJ may grant approval to deviate from this requirement. In such cases, each room shall have a minimum clear area of 360 square feet, exclusive of fixed or wall-mounted cabinets and built-in shelves, with a minimum of 18 feet clear dimension exclusive of fixed cabinets and built-in shelves.
- 7.7.A2 Room(s) for cardiovascular, orthopedic, neurological, and other special procedures that require additional personnel and/or large equipment. This room shall have, in addition to the above, a minimum clear floor area of 600 square feet, with a minimum of 20 feet clear dimension exclusive of fixed or wall-mounted cabinets and built-in shelves. When open-heart surgery is performed, an additional room in the restricted area of the surgical suite, adjoining this operating room, shall be designated as a pump room where extracorporeal pump(s), supplies and accessories are stored and serviced. When 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. Appropriate plumbing and electrical connections shall be provided in the cardiovascular, orthopedic, neurosurgical, pump, and storage rooms.
- A.7.7.A2 Where renovation work is undertaken, every effort shall be made to meet the minimum standards. If it is not possible to meet the square-foot standards, approval to deviate from this requirement may be granted. In such cases, orthopedic surgical rooms may have a minimum clear area of 360 square feet and a minimum dimension of 18 feet. Rooms for cardiovascular, neurological, and other special procedures may have a minimum clear area of 400 square feet.
- These larger operating room standards are not meant to be applied when orthopedic procedures described in the operational narrative are limited to minor cases only.
- 7.7.A3 A room for orthopedic surgery. In addition to the requirements of 7.7.A2., this room shall provide enclosed storage space for splints and traction equipment. Storage may be outside the operating room, but shall be conveniently located. If a sink is used for the disposal of plaster of Paris, a plaster trap shall be provided.
- 7.7.A4 (Not Used)
- A.7.7.A4 The former requirements of this section have been deleted. Cystoscopic and endo-urologic procedures need not be done in a sterile environment (e.g. surgical suite). However, when cystoscopic and other endo-urologic procedures are performed in the surgical suite they should not be performed in a room with a floor drain. Many concerns are raised when a floor drain is present. Floor drains can harbor pathogens and introduce greater risk for health-care-acquired infections. Several fluid disposal options are now available in the health care industry which obviates the need for a floor drain. Thus, surgical cystoscopic and other endo-urologic procedures can simply be covered under 7.7.A1 and meet the requirements of general operating rooms.
- 7.7.A5 (Not Used)
- 7.7.A6 (Not Used)
- 7.7.A7 The surgical suite shall be located and arranged to prevent non-related traffic through the suite.

7.7.B Adjunct Patient Areas

7.7.B1 Preoperative patient holding area(s). In facilities with two or more operating rooms, areas shall be provided to accommodate surgical patients and be located convenient to the surgical suite. These areas shall comply with the requirements of section 2.3. The number of patient holding stations shall be specified in the operational narrative, but no less than two shall be provided.

A.7.7.B1 The purpose of preoperative holding is to minimize operating room down time between cases and eliminate the possibility of patients waiting in the corridors. The location would preclude travel via elevators or through public areas/corridors.

7.7.B2 Post-Anesthetic Care Units (PACUs)

Each PACU shall meet the requirements of patient holding areas in section 2.3. At least one door to the Phase I recovery room shall access directly from the surgical suite without crossing public hospital corridors. The number of patient holding stations shall be specified in the operational narrative, but no less than two shall be provided. Provisions to comply with sections 2.7.F, 2.7.G, and 2.7.H shall be made within or immediately adjoining the PACU.

A7.7.B2 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.

7.7.C Service Areas

Service areas shall be provided within the surgical suite consistent with the requirements of Section 2.7 and the operational narrative. Additional requirements include:

7.7.C1 (Not Used)

7.7.C2 (Not Used)

7.7.C3 Provide within the restricted suite readily accessible to any operating room, a room for emergent reprocessing of surgical patient care items for immediate use. The surgical suite shall be arranged to allow access to these rooms without traveling through an operating room. The room shall include a work sink sized to accommodate the instrument containers used, countertop, built-in storage for supplies needed for reprocessing, separate handwashing facilities, and the high speed sterilizer as described in the operational narrative. The room shall be designed to allow a soiled to clean work flow with sufficient space to support proper cleaning, decontamination, inspection, and assembly of instruments into containers prior to sterilization and avoid environmental contamination.

A.7.7.C3 These facilities may be located in central services if convenient. Additional space should be provided as the number of rooms served, amount/types of equipment, and/or the expected number of staff working in the room increases, although the amount of “flash sterilizing” done should be minimized. The countertop and handwashing requirements should address the need for various work functions to be performed in the room as described in the operational narrative. Requirement for a separate room can be waived if adequate separation from other functions within the surgical suite is provided to avoid cross contamination and the required facilities are located near to each other. Note that environmental contamination can result from air borne dust, droplet nuclei, and aerosols as well as physical contact. Therefore it is recommended that as much separation as possible be provided between decontamination and inspection/assembly functions.

7.7.C4 (Not Used)

7.7.C5 Two scrub positions shall be provided near the entrance to each operating room. Two scrub positions may serve two operating rooms if both are located adjacent to the entrance of each

operating room. Scrub facilities shall be arranged to minimize incidental splatter on nearby personnel, medical equipment, or supply carts. The scrub sinks shall be out of the main traffic areas.

7.7.C6 The soiled workroom shall be provided for the exclusive use of the surgical suite.

7.7.C7 (Not Used)

A.7.7.C7 An operating room suite design with a clean core must provide for no cross traffic of staff and supplies from the decontaminated/soiled areas to the clean areas.

7.7.C8 Medical gas storage facilities. Main storage of medical gases shall be consistent 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.C9 Provide workcounters, work sinks, and shelving for reprocessing, testing, and storage of anesthesia equipment and supplies. Provide for separation of clean and soiled items. Sufficient space shall be available for storage of anesthesia carts, medical gas cylinders, and other anesthesia equipment.

7.7.C10 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 or 50 square feet per operating room, whichever is greater.

7.7.C11 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, water closets, handwashing facilities, and space for donning surgical attire. These areas shall be so that personnel enter from outside the surgical suite, change, and move directly into the surgical suite.

7.7.C12 A Staff lounge shall be provided in the suite.

7.7.C13 (Not Used)

7.7.C14 Outpatient Recovery

If the operational narrative includes outpatient surgery, provisions shall be made for separating outpatients into two categories, (Phase I) patients receiving general anesthesia and (Phase II) patients not subjected to general anesthesia. This requirement shall be satisfied by separate rooms. Recovery spaces shall meet the requirements of Section 2.3.

7.7.C15 Change areas for outpatients and same-day admissions.

If the operational narrative 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 include a waiting room, locker(s), water closet(s), and clothing change or gowning area. Changing may also be accommodated in a private holding room or cubicle.

7.7.C16 Provisions shall be made for patient examination, interviews, preparation, testing, and obtaining vital signs of patients for outpatient surgery.

7.7.C17 (Not Used)

- 7.7.C18 Storage areas for portable X-ray equipment, stretchers, fracture tables, warming devices, auxiliary lamps, etc., shall be provided. These areas shall be out of corridors and traffic.
- 7.7.C19 A housekeeping room shall be provided for the exclusive use of the surgical suite.
- 7.7.C20 An area for preparation and examination of frozen sections shall be provided consistent with the operational narrative.
- 7.7.C21 (Not Used)
- 7.7.C22 Refrigerated blood bank storage shall be provided consistent with the operational narrative.
- 7.7.C23 Refrigeration facilities for harvested organs shall be provided consistent with the operational narrative.
- 7.7.C24 Space for pathological specimen storage prior to transfer to pathology section shall be provided.
- 7.7.C25 (Not Used)
- 7.7.C26 Provide space for convenient access to and use of emergency crash carts at both the surgical and recovery areas.

7.8 Obstetrical Facilities

7.8.A Obstetrical Suite

7.8.A1 The obstetrical unit shall be located and designed to prohibit non-related traffic through the unit. When delivery and operating rooms are in adjacent areas, 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.

A.7.8.A1 Gynecological cases can use the obstetrical inpatient rooms if the hospital complies with State of Michigan licensing rule 325.1051(a). A gynecological surgical procedure must be performed in an operating room unless it is done during the same session as a delivery or c-section.

7.8.A2 Postpartum Unit

- a. Postpartum bedrooms shall meet the requirements for patient rooms in Section 7.2.A.

Where rooming in is described in the operational narrative, an additional 30 square feet of clear area per bassinets shall be provided with a minimum of 3 feet of clearance between walls and the sides and foot of the bassinets and between the bed and the bassinets.

A.7.8.A2 Where renovation work is undertaken, every effort shall be made to meet the minimum standards. If it is not possible to meet the 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 of clear floor area per bed in multiple-bed rooms and 100 square feet in single-bed rooms.

- b. Service areas for this unit shall be provided consistent with the requirements of Section 2.7. Additional requirements include:

- (1) Staff lounge facilities shall be provided.

- (2) The soiled workroom shall be provided for the exclusive use of the obstetrical suite.
- (3) Provide at least one bath or shower for every six beds or fraction thereof that is not served by connecting bath or shower. Such facilities shall have direct access to toilet and handwashing, include provisions for storage of supplies, allow for privacy of all users of designed with multiple fixtures, and be accessible from a common corridor.
- (4) A housekeeping room shall be provided for the exclusive use of the postpartum unit.
- (5) Nurseries shall be provided consistent with Section 7.4.

c. Airborne Infection Isolation Room(s)

Provisions for airborne infection isolation shall be made for obstetrical patients within the department. The total number of infection isolation rooms shall be determined by an infection control risk assessment. Airborne infection isolation room(s) shall comply with the requirements of Section 7.2.C.

7.8.A3 Delivery Suite

- a. Delivery room(s) shall have a minimum clear floor area of 360 square feet with a minimum dimension of 16 feet exclusive of built-in shelves or cabinets. There shall be a minimum of one such room in every obstetrical service.
- b. (Not Used)
- c. Infant resuscitation space that complies with section 2.7.E shall be provided within the caesarean/delivery room(s) or may be provided in a separate, but immediately accessible room.
- d. Labor room(s) (LDR/LDRPs rooms may be substituted.) Where LDRs or LDRPs are not provided, a minimum of two labor beds shall be provided for each delivery room. Labor rooms shall comply with 7.2.A except that a window is not required. Provide at least one bath or shower for every six beds or fraction thereof that is not served by connecting bath or shower. Such facilities shall have direct access to toilet and handwashing, include provisions for storage of supplies, allow for privacy of all users of designed with multiple fixtures, and be accessible from a common corridor.
- e. Recovery room(s) (LDR/LDRPs may be substituted.) Recovery areas (shall comply with the requirements of Section 2.3) and may be omitted in hospitals with fewer than 1500 births per year. 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. There shall be enough space for baby and crib, and a chair for the support person.
- f. Service areas shall be provided, consistent with the requirements of Section 2.7. Additional requirements include:
 - (1) 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 delivery suite shall be provided.
 - (2) A waiting room, with toilet rooms, telephones, and drinking fountains conveniently located.

- (3) A sterilizing facility(ies) with high-speed sterilizer(s) or other sterilizing equipment for immediate or emergency use shall be grouped to several delivery rooms for convenient, efficient use consistent with section 7.7.C3 and the operational narrative. Where justified by the operational narrative, sterilization equipment for the delivery suite can be replaced by sufficient storage capacity for backup supplies.
- (4) Scrub facilities. Two scrub positions shall be provided near the entrance to each delivery room(s). Two scrub positions may serve two delivery rooms, if both are located adjacent to the entrance of each delivery room. Scrub facilities shall be arranged to minimize incidental splatter on nearby personnel, medical equipment, or supply carts. The scrub sinks shall be out of the main traffic areas. Scrub sinks shall be located outside the clean core.
- (5) Medical gas storage facilities. Main storage of medical gases may be outside or inside the facility, consistent with NFPA 99. Provision shall be made for additional separate storage of reserve gas cylinders necessary to complete at least one day's procedures.
- (6) An anesthesia workroom for cleaning, testing, and storing anesthesia equipment shall be provided. This room shall contain work counter(s) and sink(s) and racks for medical gas cylinders. Provisions shall be made for separate storage of clean and soiled items. The anesthesia workroom shall provide space for anesthesia case carts and other anesthesia equipment.
- (7) Staff clothing change areas. Appropriate areas shall be provided for male and female personnel (orderlies, technicians, nurses, and doctors) working within the obstetrical suite. The areas shall contain lockers, showers, water closets, handwashing facilities, and space for donning surgical attire. These areas shall be arranged so that personnel entering from outside the obstetrical suite can change and move directly into the obstetrical suite.
- (8) Male and female support persons change area (designed as described above).
- (9) Staff lounge and toilet facilities. Separate or combined lounges for male and female staff shall be provided. Lounge(s) shall be designed to minimize the need to leave the obstetrical suite and to provide convenient access to the recovery room.
- (10) An on-call room(s) for physician and/or staff may be located elsewhere in the facility.
- (11) A housekeeping room shall be provided for the exclusive use of the delivery suite.
- (12) Storage areas for portable X-ray equipment, stretchers, warming devices, auxiliary lamps, etc. These areas shall be out of corridors and traffic.

7.8.A4

LDR and LDRP Facilities

- a. When provided by the operational narrative, delivery procedures in accordance with birthing concepts may be performed in the LDR or LDRP rooms. LDR room(s) may be located in a separate LDR suite or as part of the caesarean/delivery suite. The postpartum unit may contain LDRP rooms. These rooms shall have a minimum of 250 square feet of clear floor area with a minimum dimension of 13 feet, exclusive of toilet room, closet, alcove, or vestibules. There shall be enough space for crib and reclining chair for support person. An area within the room, but distinct from the mothers area, shall be provided for infant stabilization and resuscitation. Medical gas outlets shall be located in the room so that they are accessible to the mother's delivery area and infant resuscitation area.

- b. Each LDR or LDRP room shall be for single occupancy and have direct access to a private toilet with shower or tub. Each room shall be equipped with handwashing facilities.
- c. Each LDRP shall have a window consistent with Section 7.28.A10.
- d. Service areas for this unit shall be provided consistent with the requirements of Sections 7.8.A2.b. and 7.8.A3.f.

A.7.8.A4 Line of sight privacy from the corridor door(s) to the birthing location should be provided.

7.9 Emergency Service

A.7.9.A 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 operational narrative.

7.9.B (Not Used)

7.9.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.

A.7.9.C 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. It is important that the hospital, in those cases, be able to assess and stabilize emergent illnesses and injuries and arrange for appropriate transfer.

Provisions for initial emergency management shall include:

7.9.C1 A well-marked, illuminated, and covered entrance, at grade level

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

Exception: Specialty Hospitals which do not provide emergency services shall indicate by signage that NO EMERGENCY SERVICE is available.

7.9.C2 Examination/treatment rooms consistent with the requirements of Section 2.7.E., except that the 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 per patient cubicle.

7.9.C3 Storage out of traffic and under staff control for general medical/surgical emergency supplies, medications, and equipment such as ventilator, defibrillator, splints, etc. shall be provided.

7.9.C4 Provisions for reception, control, and public waiting, including a public toilet room with handwashing facility(ies), and telephone

7.9.C5 Patient toilet rooms shall be provided at a ratio of one for every eight treatment stations or fraction thereof.

7.9.C6 (Not Used)

7.9.C7 Airborne Infection Control

A.7.9.C7 The need for airborne infection isolation rooms or protective environment rooms in a facility should be determined by an infection control risk assessment. See A7.2.C for details.

7.9.C8 The unit shall be served by support spaces as defined by the operational narrative and consistent with Section 2.7.

7.9.D Definitive Emergency Care

The type, size, and number of the services shall be as defined in the operational narrative. As a minimum, the following shall be provided.

A.7.9.D 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 shall 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.D1 A grade-level well-marked, illuminated, and covered entrance. There shall be direct access to this entrance from public roads for ambulance and vehicle traffic. The entrance and driveway shall be clearly marked. If a raised platform is used for ambulance discharge, provide a ramp for pedestrian and wheelchair access.

7.9.D2 Paved emergency access to permit discharge of patients from automobiles and ambulances, and parking convenient to the entrance.

7.9.D3 Reception, triage and control station shall be located to permit staff in at least one of these areas to observe and control access to the treatment area, pedestrian and ambulance entrances, and the public waiting area.

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. If determined by the infection control risk assessment, one or more separate, enclosed spaces designed and ventilated as airborne infection isolation rooms shall be required.

A.7.9.D3 The design of the emergency 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 visibility 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.

7.9.D4 Wheelchair and stretcher storage shall be provided for patients. This shall be out of traffic with convenient access from emergency entrances.

- 7.9.D5 Public waiting area, toilet facilities, drinking fountains, and telephones shall be provided. If so determined by the hospital infection control risk assessment, the emergency department waiting area shall require special measures to reduce the risk of airborne infection transmission.
- A.7.9.D5 See the "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities."
- 7.9.D6 Communication center shall be convenient to nursing station and have radio, telephone, and intercommunication systems.
- 7.9.D7 Examination and treatment room(s) shall be designed consistent with the requirements of Section 2.7.E., except that the 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 per patient cubicle.
- A.7.9.D7 Treatment/examination rooms used for pelvic exams should allow for the foot of the examination table to face away from the door.
- 7.9.D8 Trauma/cardiac rooms for emergency procedures, including emergency surgery, shall have at least 250 square feet of clear floor space. Each room shall have an examination light, work counter, medical equipment, cabinets, storage for patient care supplies, and counter space for writing. There shall be at least one X-ray film illuminator in each room or PACS. Additional space with cubicle curtains for privacy shall be provided to accommodate more than one patient at a time in the trauma room. Provisions shall be made for monitoring the patient. There shall be storage 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 wide to simultaneously accommodate stretchers, equipment, and personnel.
- A.7.9.D8 Access needs to be convenient to the ambulance entrance. 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 standards, doorways leading from the ambulance entrance to the room may be 4 feet wide.
- 7.9.D9 Provisions for orthopedic and cast work may be in separate room(s) or in the trauma room. They shall include storage for splints and other orthopedic supplies, traction hooks, work counters and examination lights. There shall be at least one X-ray film illuminator or PACS in each room. If a sink is used for the disposal of plaster of Paris, a plaster trap shall be provided. The room(s) shall be designed consistent with the requirements of Section 2.7.E, except that the 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 per patient cubicle consistent with section 2.3.
- 7.9.D10 Scrub stations shall be located adjacent to each trauma room.
- 7.9.D11 For routine patient decontamination needs the hospital shall provide decontamination facilities that minimally includes the following building elements:
- a. An outside entrance and internal door to a corridor of the emergency department.
 - b. All sanitary waste (sink, floor drains) shall discharge to a dedicated holding tank.
 - c. A negative air environment, exhausted at least 25 feet from exterior doors, operable windows, or domestic air intakes.
 - d. A hand held showerhead with temperature controls.
 - e. The decontamination area ceiling, wall, and floor finishes shall be smooth, monolithic, nonporous, non-adsorptive, and scrubable, (capable of withstanding cleaning with and exposure to harsh chemicals.) Floor finishes shall be non-slip.

A.7.9.D11

The recent emphasis in mass decontamination has overshadowed the traditional needs that hospitals have for occasional decontamination of a more limited number of individuals. Obviously the needs, level of care, and regulations of contamination victims change from field conditions to those patients in hospitals.

State licensed and federally certified facilities and hospitals come under a number of government regulations. These regulations include the need to protect patient rights (privacy and dignity) and their general well being as well as the health and safety of staff and the public. Voluntary accreditation guidelines may add further standards.

The decontamination area must be sealed and cleanable as noted above. The ability to keep the room "seamless" will eliminate contamination and prevent moisture damage. Provide wet location light fixtures and place light switches outside the room.

Use moisture resistant privacy curtains to accommodate the privacy of one or two patients. If two are planned, provide two showerheads.

Water drainage must be contained and disposed of safely to ensure that it does not enter the hospital or community drainage system. It is easiest to use a tank that has a sampling port for determining the hazardous nature of the contents and a meter to tell when it is full. Local laws will regulate if you can install and use a "bypass valve", where tank contents can be emptied into a sanitary sewer line. Consider if there is the need to provide a hand sink and emergency eyewash station that drain into this holding tank.

This room should meet all the requirements of air borne infectious isolation rooms including handwashing facilities, work counter(s) and patient care supply storage. Assess the need for a vestibule or anteroom. Remember that space will be needed for additional storage for personal protective equipment and decontamination supplies.

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.

As the frequency and types of decontamination cases seen in hospitals varies widely, the issue of what constitutes a proper decontamination facility should be defined by the hospital risk assessment.

Note that this room can be used for isolation or other functions when not needed for decontamination. As decontamination cases place significant additional resource burdens on hospitals, it can be expected that distribution of victims to other facilities would be dictated by the hospital emergency preparedness planning.

These plans should be based on a hazardous vulnerability assessment and consider how to accommodate large volumes of patients without bringing them into the Emergency Service itself.

In the case of catastrophic events, decontamination victims should be directed away from the hospital in order to protect and preserve it for more acute care. Portable decontamination structures and even pole barns or garages could be used if properly equipped.

Note that during extreme emergency conditions, regulatory standards are often waived, however use of temporary decontamination structures for routine cases could result in citations being issued against the hospital as these structures do not appropriately support normal hospital based care.

7.9.D12

(Not Used)

- 7.9.D13 (Not Used)
- 7.9.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 room shall be located in an area easily accessible to staff but out of normal traffic patterns.
- 7.9.D15 Toilet rooms for patients shall be provided at the ratio of one for every eight treatment stations or fraction thereof.
- 7.9.D16 Service areas shall be provided consistent with the requirements of Section 2.7 and the operational narrative.
- A.7.9.D.16 Diagnostic radiology, laboratory, and pharmaceutical services should be conveniently accessible to the department.
- 7.9.D17 (Not Used)
- 7.9.D18 (Not Used)
- 7.9.D19 (Not Used)
- 7.9.D20 (Not Used)
- 7.9.D21 Security
- A security system shall be provided consistent with the operational narrative.
- A.7.9.D21 A security station and/or system should be located to maximize visibility of the treatment areas, waiting areas, and key entrance sites. This system should include visual monitoring devices installed both internally in the emergency department, as well as externally at entrance sites and parking lots. Spatial 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, 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 back-up system.
- 7.9.D22 Airborne Infection Isolation Room. At least one airborne infection isolation room shall be provided consistent with Section 7.2.C., except that bathing facilities are not required. The need for additional airborne infection isolation rooms shall be determined by the infection control risk assessment.
- 7.9.D23 Bereavement Room
- A.7.9.D23 A family room to provide privacy for families of critically ill or deceased patients should be located away from the main traffic and treatment areas. An enclosed room with space for comfortable seating of three to six persons should be provided; telephone access is essential. A salon or parlor-type ambience and incandescent lighting is preferred.
- 7.9.D24 Secured Holding Room
- At least one holding/seclusion room of 120 square feet shall be provided. This room shall allow for security, patient and staff safety, patient observation, and soundproofing.
- 7.9.D25 (Not Used)

7.9.E Other Space Considerations

A.7.9.E When the operational narrative defines the need, a separate pediatric emergency area, observation/holding unit for patients requiring observation up to 23 hours or admission to an inpatient unit, a separate fast track area when annual emergency department visits exceed 20,000-30,000 visits, and patient hygiene room with shower and toilet facilities should be considered.

7.10 Diagnostic and Therapeutic Radiology

(Angiography, MRI, cardiac catheterization lab, nuclear medicine, radiation therapy, PET, CT, radiology, fluoroscopy, mammography, etc.)

7.10.A General

7.10.A1 Diagnostic and Therapeutic radiology rooms shall be sized in compliance with manufacturers' recommendations. Where a table is used the room shall be sized to provide a minimum 3'-0" clearance for access to the patient on 3 sides of the table and facilitate bed transfer. The door swing shall not encroach on the equipment or patient circulation or transfer space.

A.7.10.A1 The required clearance allows for emergent access to the patient and is based on the table in the transfer position.

Radiography and stereotactic mammography rooms should be a minimum of 180 square feet. (Dedicated chest X-ray may be smaller.)

Tomography and Radiography/Fluoroscopy (R & F) rooms should be a minimum of 250 square feet.

Mammography rooms should be a minimum of 100 square feet.

Minimum size should be 260 square feet for the simulator room.

Minimum size, including the maze, should be 680 square feet for accelerator rooms and 450 square feet for cobalt rooms.

7.10.A2 Angiography rooms, cardiac catheterization labs and similar procedure rooms shall have a minimum of 400 square feet of usable floor space exclusive of cabinetry, with clearance of at least 3'0" around the procedure table. The door swing shall not encroach on the equipment or patient circulation space.

7.10.A3 The location of controls for equipment shall provide for a full view of the patient by staff.

7.10.A4 For angiography and cardiac catheterization labs and similar procedure rooms, a scrub sink shall be provided in a space on the outside of the staff entry door to the room. In addition, a handwashing facility shall be provided within the procedure room.

7.10.A5 An environmentally controlled equipment room(s) or enclosure(s) in compliance with manufacturers' recommendations shall be provided which is large enough to contain X-ray transformers, power modules, and associated electronics, and electrical equipment for angiography, cardiac catheterization, and similar procedure rooms.

A.7.10.A5 Some equipment may require additional air conditioning for the computer room.

7.10.B Support Spaces and Services

- 7.10.B1 A control/reception space shall be provided.
- 7.10.B2 Waiting/Holding Area:
- a. Patient and public waiting areas shall be provided. If waiting space serves both inpatients and outpatients, the area shall be designed to assure visual privacy for patients.
 - b. A holding area for patients on stretchers or beds shall be provided out of traffic and under control of staff. The holding area shall comply with the requirements of 2.3.
 - c. If so determined by 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 2A). See the "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities."
- 7.10.B3 Toilet rooms with handwashing facilities shall be provided convenient to the patient waiting rooms and shall be equipped with emergency call systems. Separate toilet rooms shall be provided with direct access from each ultrasound and fluoroscopic room.
- 7.10.B4 Patient dressing rooms shall provide a seat or bench, mirror, and provisions for storing patient clothing and for securing valuables.
- 7.10.B5 Staff Facilities
- a. Toilet rooms and locker rooms shall be provided to accommodate staff working on the service(s).
 - b. Space shall be provided for staff gowning.
- 7.10.B6 A film storage space for storage of active patient films or records shall be provided for imaging services within the suite consistent with the operational narrative.
- A.7.10.B6 See discussion of PACS in 2.12.
- 7.10.B7 Secure space shall be provided for inactive film and medical record storage consistent with the operational narrative.
- 7.10.B8 Storage space shall be provided for unexposed film consistent with the operational narrative.
- 7.10.B9 Provisions shall be made for film processing. Film processing equipment shall be in close proximity to procedure rooms. View boxes for evaluating film following processing shall be located in close proximity to film processing equipment. If automatic film processors are used, a sink of adequate size shall be provided to clean the processor racks.
- 7.10.B10 Offices for physicians and administrative staff shall be provided for viewing, consultations, and charting.
- 7.10.B11 Specialty Support Rooms or Spaces:
- a. Contrast media preparation rooms shall include a sink, counter and secured storage for media and supplies.
 - b. A dosimetry equipment area shall be provided for radiotherapy suite.
 - c. A room shall be provided for radiopharmaceutical preparation and/or storage of pre-prepared materials.

- d. (Not Used)
- e. (Not Used)
- f. A mold room shall be provided for the radiotherapy suite. Space shall be provided for the storage of blocks used in radiotherapy treatments.
- g. Exam rooms shall be provided in the radiotherapy suite consistent with the operational narrative. Each exam room shall be consistent with Section 2.7.E.
- h. The patient preparation and post-procedure observation area provided for invasive procedures shall be located convenient to the radiology rooms and meet the requirements of Section 2.3.

7.10.B12 Service areas consistent with Sections 2.7.F, 2.7.G, 2.7.H, and 2.7.Q shall be provided.

7.10.B13 (Not Used)

7.10.B14 (Not Used)

7.10.B15 Support facilities serving the MRI shall accommodate cryogen servicing and emergency venting of the magnet. Clearly visible warning signs shall be provided within the support facility at or beyond the limit of the 5 gauss field strength. Housekeeping facilities shall be conveniently provided for separate MRI nonmagnetic cleaning equipment.

7.10.B16 Positron Emission Technology scanners shall be provided with private uptake rooms for the number of patients specified in the operational narrative that comply with 2.3 that are conveniently located to the unit.

A.7.10.B16 Typically at least two uptake rooms will be needed, but additional rooms will be required if secondary (delayed) scans are planned. The rooms should be designed to provide “quiet” uptake (minimal stimulation, physical/mental activity) in order to facilitate the best possible image quality. These rooms are required to be shielded for the high levels of ionizing radiation associated with the contrast media used.

7.10.C (Not Used)

7.10.D (Not Used)

7.10.E (Not Used)

7.11 Procedure Rooms

Each procedure room shall have a minimum clear floor area of 250 square feet, exclusive of any fixed cabinets or built-in shelves that allows for a minimum 5 foot clearance on all sides of the patient table or stretcher. Rooms shall include clean supply storage facilities, workcounter, and handwashing facilities as per section 2.1.A. A system for staff emergency communication shall be provided consistent with the requirements of Section 7.32.G4.

A.7.11 This section is intended to be applied to any such room where the clinical function is less acute than general surgery or catheterization but more acute than expected to be performed in examination/treatment rooms.

In addition, the following requirements shall also apply:

7.11.A Bronchoscopy and Endoscopy

Dedicated reprocessing room(s), accessible to a corridor, shall be provided for cleaning and disinfecting of endoscopy scopes. At a minimum each reprocessing room shall be arranged to provide a soiled to clean work flow and include: a large sink for immersion/cleaning of scopes; handwashing fixture consistent with Section 2.1.A; work counters for drop off, soaking tubs, automatic endoscope cleaners as described in the operational narrative, visual inspection, and charting; compressed air outlet at the large sink; and vacuum inlet for scope drying.

Endoscopy scope storage cabinets shall be provided outside the procedure and reprocessing rooms that allow for storage of the scopes in an area restricted to staff only or a clean supply room.

A.7.11.A Refer to sections 7.28.B8, 7.31.D24, and 7.31.D28.

7.11.B Non-Surgical Cystoscopy, Lithotripsy, Urology (no additional requirements)

7.11.C Minor (no general anesthesia) Surgical Room

Replace clean supply storage, workcounter, and handwashing facilities with a scrub sink near the entrance. Scrub facilities shall be arranged to minimize incidental splatter on nearby personnel, medical equipment, or supply carts. The scrub sinks shall be out of the main traffic areas.

7.12 Laboratory

Clinical laboratory facilities shall be provided consistent with the scope of services detailed in the operational narrative.

A.7.12 Laboratory facilities should 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 operational narrative. Certain procedures may be performed on-site or provided through a contractual arrangement with a laboratory service acceptable to the authority having local jurisdiction.

Facilities for specimen collection (blood & urine) should be provided. Specialized facilities may be required for drug testing. At least 1 specimen collection station should be designed to accommodate a stretcher. Specimen collection areas should not be located within laboratory work space.

7.12.A Laboratory work counter(s) with space for microscopes, chemical analyzer(s), incubator(s), centrifuge(s), etc., shall be provided. Work areas shall include sinks with water and access to vacuum, gases, air, and electrical services as needed.

7.12.B Refrigerated blood storage facilities for transfusions shall be provided. Blood storage refrigerators shall be equipped with temperature-monitoring and alarm signals.

7.12.C Lavatory(ies) or counter sink(s) equipped for handwashing shall be provided.

7.12.D Storage facilities, including refrigeration, for reagents, flammable liquids, standards, supplies, stained specimen microscope slides, etc., shall be provided.

7.12.E Specimen (blood, urine, and feces) collection facilities shall be provided separate from the laboratory workspace.

a. The blood collection area shall have a work counter, space for patient seating, and handwashing facilities.

b. Urine and feces collection room shall be equipped with water closet and lavatory. This facility may be located outside the laboratory suite.

- c. Make provisions for the collection of sputum for patients suspected of having infectious Mycobacterium tuberculosis consistent with Section 7.15.E., if indicated by the Infection Control Risk Assessment.

7.12.F Chemical safety provisions shall be provided in the work areas.

A.7.12.F See 7.28.A24 for eyewash and emergency shower facilities.

7.12.G (Not Used)

7.12.H (Not Used)

7.12.I Administrative areas, including offices and space for clerical work, filing, reception, and record maintenance, shall be provided.

7.12.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.

7.12.K Patient waiting facility shall be conveniently located. It may be outside the laboratory area and shared with other departments.

7.13 Rehabilitation Therapy

7.13.A 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 consistent with the operational narrative. Where two or more rehabilitative services are included, items may be shared, as appropriate.

7.13.B Common Elements

Each rehabilitative therapy department shall include service areas consistent with the requirements of Sections 2.7.C, 2.7.L, 2.7.M, 2.7.O, and 2.7.Q, in addition to the following, which may be shared or provided as separate units for each service.

7.13.B1 Office and clerical space with provision for filing and retrieval of patient records.

7.13.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.B3 Patient waiting area(s) out of traffic with provision for wheelchairs.

7.13.B4 (Not Used)

7.13.B5 (Not Used)

7.13.B6 (Not Used)

7.13.B7 (Not Used)

7.13.B8 Convenient access to toilets and lockers

7.13.B9 Access to a demonstration/conference room

7.13.C Physical Therapy

If physical therapy is part of the service, the following, at least, shall be included:

- 7.13.C1 Individual treatment area(s) with privacy screens or curtains. Each such space requiring a table or stretcher shall have not less than 70 square feet of clear floor area.
- 7.13.C2 (Not Used)
- 7.13.C3 Exercise Area and Facilities
- 7.13.C4 Clean Linen and Towel Storage
- 7.13.C5 (Not Used)
- 7.13.C6 Separate storage for soiled linen, towels, and supplies.
- 7.13.C7 If required by the operational narrative, patient dressing areas, showers, and lockers shall be provided.
- 7.13.C8 Thermotherapy, diathermy, ultrasonics, and hydrotherapy shall be provided when required by the operational narrative.
- 7.13.D Occupational Therapy**
- A.7.13.D An area for teaching daily living activities should be provided. It should also contain an area for a bed, kitchen counter with appliances and sink, bathroom, and a table/chair. The facilities should be similar to a residential environment.
- 7.13.D1 Work areas and counters suitable for wheelchair access
- 7.13.D2 (Not Used)
- 7.13.D3 (Not Used)
- 7.13.D4 (Not Used)
- 7.13.E Prosthetics and Orthotics**
- If this service is provided, the following, at least, shall be included.
- 7.13.E1 Workspace for technicians
- 7.13.E2 Space for evaluating and fitting, with provision for privacy
- 7.13.E3 (Not Used)
- 7.13.E4 Space for prosthetics/orthotics lab environmentally controlled for the fabrication/modification of devices
- 7.13.F Speech and Hearing**
- If this service is provided, the following, at least, shall be included.
- 7.13.F1 Space for evaluation and treatment
- 7.13.F2 (Not Used)
- 7.14 Renal Dialysis Unit (Acute and Chronic)**

A.7.14 The unit should comply with the guidelines of the Association for Advancement of Medical Instrumentation (AAMI) and the requirements of the CMS as found in 42 CFR section 405.2102 and following for End Stage Renal Disease (ESRD).

7.14.A General

Acute care dialysis may occur at patient bedside in critical care units and elsewhere. In these cases, dedicated utilities (water and waste drain) shall be provided. Section 7.14 shall apply to chronic outpatient (ESRD) facilities or dedicated inpatient units in hospital and nursing facilities.

7.14.A1 (Not Used)

7.14.A2 (Not Used)

A.7.14.A2 The location should offer convenient access for outpatients. Accessibility to the unit from parking and public transportation should be a consideration.

7.14.A3 (Not Used)

A.7.14.A3 Space and equipment should be provided as necessary to accommodate the operational narrative, which may include acute (inpatient services) and chronic cases, home treatment and kidney reuse facilities. Inpatient services (acute) may be performed in critical care units and designated areas in the hospital, with appropriate utilities.

7.14.B Treatment Area

7.14.B1 The treatment area shall be separate from administrative and waiting areas.

7.14.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.B3 A minimum of 100 square feet of clear floor area shall be provided per bed/stretchers treatment station. A minimum of 80 square feet of clear floor area shall be provided per chair treatment station. A minimum of 4 feet clearance shall be provided between chairs/beds/stretchers, between the side of chair/beds/stretchers and walls, and beyond the foot of the station as an aisle for access to each station. Provide a minimum head wall width of 8 feet for treatment stations. Handwashing facilities shall be provided consistent with Section 2.1.A.

7.14.B4 (Not Used)

7.14.B5 The unit shall be designed to provide privacy for each patient.

7.14.B6 The number of and need for required airborne infection isolation rooms shall be determined by an infection control risk assessment. When required, the airborne infection isolation room(s) shall be consistent with the requirements of Section 7.2.C., except that toilet rooms and bathing facilities are not required.

7.14.B7 Service areas shall be provided consistent with the requirements of 2.7 and the operational narrative.

7.14.B8 (Not Used)

7.14.B9 (Not Used)

7.14.B10 (Not Used)

7.14.B11 (Not Used)

- 7.14.B12 If dialyzers are reused, a reprocessing room is required. It shall be sized to perform the functions required. The reprocessing room shall be designed to provide work flow from soiled to clean.
- 7.14.B13 (Not Used)
- 7.14.B14 The housekeeping room shall be for the exclusive use of the unit.
- 7.14.B15 If required by the operational narrative, an equipment repair and breakdown room shall be provided. It shall be equipped with a handwash sink, work counter and storage cabinet.
- 7.14.B16 (Not Used)
- 7.14.B17 (Not Used)
- 7.14.B18 (Not Used)
- 7.14.B19 Each facility shall provide a separate room for storage of bulk materials, equipment used in preparation and clean-up of jugs used for providing dialysis solutions consistent with the operational narrative. This room can be used for water treatment or other bulk storage functions.
- 7.14.B20 The water treatment equipment shall be located in an enclosed room.
- 7.14.B21 Provide a patient toilet room convenient to the treatment area.

7.14.C Ancillary Facilities

- 7.14.C1 Staff clothing change areas. Appropriate areas shall be provided for male and female personnel (orderlies, technicians, nurses, and doctors) working within the unit. The areas shall contain lockers, water closets, handwashing facilities, and space for changing clothes.
- 7.14.C2 Storage for patients' belongings shall be provided.
- 7.14.C3 A waiting room, toilet room, drinking fountain, access to a public telephone, and seating accommodations shall be available or accessible to the dialysis unit.
- A.7.14.C3 Before the proliferation of cellular telephones, pay phones were more ubiquitous and the minimum design standards required that public telephones be provided in or near renal dialysis units. The wording has been changed to require "access to" a public telephone, which would permit the facility the option to simply allow patients to use a staff telephone in the area. If a pay phone is not provided, the phone designated for patient use should be identified with a sign. If the phone is not located in a public area, the sign should indicate how a patient might obtain access to the phone.
- 7.14.C4 Office and clinical work space shall be available for administrative services.

7.15 Respiratory Therapy Service

If respiratory therapy service is provided, the following elements shall be included as a minimum:

- A.7.15 Facilities can vary widely depending on hospital size, services offered, and the degree of decentralization as described in the operational narrative. Consideration should be made for pulmonary function testing and other outpatient services as well as the range of reprocessing methods and equipment proposed. Some facilities, such as equipment, supply storage, or outpatient toilet rooms can be shared with other departments.

- 7.15.A** Service areas consistent with the requirements of Sections 2.7.B, 2.7.C, 2.7.L, and 2.7.O.

7.15.B Space for storage of clean equipment and supplies shall be functionally separate from the space for receiving and cleaning of soiled equipment.

A.7.15.B Appropriate local exhaust ventilation (LEV) should be provided if glutaraldehyde or other noxious disinfectants are used in the cleaning process. Areas typically used for noxious disinfectants where LEV would be needed include respiratory therapy, endoscopy, central sterile processing, dialysis, and other surgical utility rooms. Position of LEV should be as close to source of hazardous gases/vapors as possible, such as placement of exhaust grill on wall at countertop height directly behind basin or sink where disinfectant will be used.

7.15.C Ancillary Facilities

7.15.C1 Office and clerical space with provision for filing and retrieval of patient records

7.15.C2 (Not Used)

7.15.C3 (Not Used)

7.15.C4 Access to a demonstration/conference room.

7.15.D If respiratory services such as testing and demonstration for outpatients are part of the program, provisions shall be made for:

7.15.D1 Patient waiting area with provision for wheelchairs.

7.15.D2 A reception and control station

7.15.D3 (Not Used)

7.15.D4 (Not Used)

7.15.E All cough-inducing procedures performed on patients who may have infectious Mycobacterium tuberculosis shall be performed in booths or special enclosures with discharge HEPA filters or exhaust directly to the outside. These procedures may also be performed in a room that meets the ventilation requirements for airborne infection Isolation. See Table 2A for ventilation requirements.

7.16 **Morgue**

7.16.A The following elements shall be provided when autopsies are performed in the hospital.

7.16.A1 Refrigerated facilities for body holding

7.16.A2 An autopsy room containing the following:

- a. A work counter with a deep sink and grinder for tissue disposal.
- b. A storage space for supplies, equipment, and specimens.
- c. An autopsy table

A.7.16.A2 Autopsy rooms should be equipped with downdraft local exhaust ventilation.

7.16.A3 A housekeeping room shall be provided convenient to the area.

7.16.A4 A clothing change area with shower, water closet, and lockers.

7.16.B If autopsies are performed outside the facility, a temperature-controlled body-holding room shall be provided.

7.16.C Provisions shall be made for body viewing and identification.

A.7.16.C Provision for a separate viewing room is recommended. This room should be in a separate location from the body holding/refrigeration room. This allows the room to be used as a viewing/grieving area.

7.17 Pharmacy

7.17.A 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 shall be described in the operational narrative. 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 narrative. (Satellite facilities, if provided, shall include those items required by the narrative.) As a minimum, the following elements shall be included.

A.7.17.A State of Michigan Board of Pharmacy general rule 338.482 requires a minimum area of 150 square feet.

7.17.B Dispensing

7.17.B1 A pickup and receiving area.

7.17.B2 Work counters and space for automated and manual dispensing activities.

7.17.B3 An area for temporary storage, exchange, and restocking of carts.

7.17.B4 Security provisions for drugs and personnel in the dispensing counter area.

7.17.C Manufacturing

7.17.C1 A bulk compounding area.

7.17.C2 Provisions for packaging and labeling.

7.17.C3 A quality-control area.

7.17.D Storage (may be cabinets, shelves, and/or separate rooms or closets).

7.17.D1 Bulk Storage

7.17.D2 Active Storage

7.17.D3 Refrigerated Storage

7.17.D4 (Not Used)

7.17.D5 Secure storage for narcotics and controlled drugs.

7.17.D6 Storage for general supplies, records and equipment not in use.

7.17.E Administration

7.17.E1 Provision for cross-checking of medication and drug profiles of individual patients.

- 7.17.E2 Poison control, reaction data, and drug information centers.
- 7.17.E3 A separate room or area for office function including desk, filing, communication, and reference.
- 7.17.E4 Provisions for patient counseling and instruction (may be in a room separate from the pharmacy).
- 7.17.E5 A room for education and training (may be in a multipurpose room shared with other departments).

7.17.F Other

7.17.F1 (Not Used)

7.17.F2. Provide for convenient access to toilet room and locker.

7.17.F3. If unit dose procedure is used, provide space and equipment for supplies, packaging, labeling, and storage, as well as a space for the carts.

7.17.F4. When sterile solutions are compounded in the pharmacy, provide a clean work area with a laminar-flow work station designed for product protection. The laminar-flow system shall include a non-hydroscopic filter rated at 99.97 percent (HEPA), as tested by DOP tests, and have a visible pressure gauge for detection of filter leaks or defects. Cytotoxic chemotherapy agents shall be prepared in a Class II: Type B1, B2, B3, or Class III Biological Safety Cabinets in accordance with the current Occupational Safety & Health Administration Technical Manual, on Controlling Occupational Exposure to Hazardous Drugs.

A.7.17.F4 The FDA and Joint Commission on Accreditation for Health Care Organizations (JCAHO) may require compliance with United States Pharmacopoeia (USP) General Chapter <797>, Pharmaceutical Compounding-Sterile Preparations. The Michigan State Board of Pharmacy, Accreditation Commission for Health Care (ACHC) and Community Health Accreditation Program (CHAP) may also require compliance.

In order to properly design the appropriate Clean Room, a risk assessment should be performed by the Health Care Organization. This risk assessment performed by the Health Care Organization should evaluate all locations where sterile pharmaceutical compounding will take place.

Note: Class II, Type “B” and Class III biological safety cabinets are the most protective since, by definition, these hoods vent to the outside and do not recirculate air (back into the room). In all cases the approved biological safety cabinet must be installed in accordance with the manufacturer’s specifications and may require special features such as pressure monitors, alarms and fan interlocked with the building exhaust so as to shut down the hood in the event of a fan failure.

7.17.F5. (Not Used)

7.18 Dietary Facilities

Food service facilities and equipment shall comply with the Michigan Food Law 2000, P.A. 92 of 2000, MCL 289.1101 et seq.; Chapters 4, 5, 6, & 7 of the Food Code.

A.7.18 An area should be provided for the receiving and control of incoming dietary supplies. This area should be separated from the general receiving area and should contain the following: a control station and a breakout for loading, uncrating, and weighing supplies. They should be convenient to the receiving area and should be located to exclude traffic through the food preparation area to reach them. Storage spaces for bulk, refrigerated, and frozen foods should be provided.

A minimum of four days supplies should be stocked. (In remote areas, this number may be increased to accommodate length of delivery in emergencies.)

A cart distribution system should be provided with spaces for storage, loading, distribution, receiving, and sanitizing of the food service carts. The cart traffic should 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 should not be through food processing areas.

Housekeeping rooms should be provided for the exclusive use of the dietary department and should contain the following: a floor sink and space for mops, pails, and supplies.

Ice making equipment should be provided and should be of a type that is convenient for service and easily cleaned. It should be provided for both drinks and food products (self-dispensing equipment), and for general use (storage-bin type equipment).

7.19 Administration and Public Areas

7.19.A (Not Used)

7.19.B The lobby shall include:

7.19.B1 A counter or desk for reception and information.

7.19.B2 Public waiting area(s)

7.19.B3 Public toilet facilities

7.19.B4 Public telephones

7.19.B5 Drinking fountain(s)

7.19.B6 Storage space for wheelchairs.

7.19.C (Not Used)

7.19.D If required by the operational narrative the area for initial admission of inpatients shall include:

7.19.D1 A separate waiting area for patients and accompanying persons.

7.19.D2 A work counter or desk for staff.

7.19.D3 A storage area for wheelchairs, out of the path of normal traffic.

7.19.E (Not Used)

7.19.F (Not Used)

7.19.G (Not Used)

7.20 Medical Records

The following shall be provided:

7.20.A Medical Records Administrator/Technician Office.

- 7.20.B** Review and Dictation Area.
- 7.20.C** Sorting, Recording, or Microfilming Records Area.
- 7.20.D** Record Storage Area with security provisions to assure confidentiality of medical records.
- 7.20.E** Area for Public Access for Review of Medical Records.

7.21 Central Services

7.21.A The Instrument Decontamination room (Soiled Workroom) shall provide facilities for holding of contaminated instruments and equipment, work sink(s) sized to accommodate the instruments in use, countertop, built-in storage for supplies associated with decontamination, handwashing facilities, and specialized equipment for cleaning and washing as described in the operational narrative. The room shall be designed to provide an orderly work flow with sufficient space for unimpeded staff movement and to avoid environmental contamination.

7.21.B The Clean Assembly/Workroom shall contain workspace and equipment for terminal sterilizing of medical and surgical equipment and supplies.

Access to sterilization room should be restricted. This room should contain Hi-Vacuum or gravity steam sterilizers and sterilization equipment to accommodate low temperature sterilizer(s) (e.g. ETO or gas plasma). This room is used exclusively for the inspection, assembly, and packaging of medical/surgical supplies and equipment for sterilization. Area should contain work tables, counters, a handwashing fixture, 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.

7.21.C Breakdown and storage facilities.

7.21.C1 An area for breakdown and storage for clean and sterile supplies shall be provided.

7.21.C2 An area for patient care equipment storage shall be provided.

7.21.D Appropriate areas shall be provided for male and female staff working within the suite. The areas shall contain lockers, water closets, handwashing facilities, and space for donning work attire.

7.21.E Provisions shall be made for full back-up of routine or emergent reprocessing of patient care items.

A.7.21.E This may be addressed by providing redundant equipment, a reserve supply of reprocessed items, or use of alternative means for reprocessing as described in the operational narrative.

7.22 General Stores

The following shall be provided:

7.22.A Off-Street Unloading Facilities.

7.22.B Receiving Area shall include space to allow for product verification, damage assessment, and inventory functions.

7.22.C General storage room(s) with a total area of not less than 20 square feet 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. The department shall be designed and arranged so that once patient

care supplies are removed from shipping containers they shall be removed from the general stores areas and kept in clean supply room facilities compliant with 2.7.F.

A.7.22.C Additional storage facilities may be needed where significant volume of outpatient services are offered.

7.22.D (Not Used)

7.23 Linen Services

7.23.A Each facility shall have provisions for storing and processing of clean and soiled linen. Processing may be done within the facility, in a separate building on-or off-site, or in a commercial or shared laundry.

7.23.B Each facility shall provide the following elements:

7.23.B1 A separate room for holding of soiled linen.

7.23.B2 A central clean linen receiving/storage room.

7.23.C If linen is processed in a laundry facility located in the hospital or hospital campus, the following shall be provided:

7.23.C1 A separate laundry processing area, with commercial equipment, sized to process at least a seven day supply within the regular scheduled work week.

7.23.C2. The laundry and equipment shall be arranged to minimize cross-contamination of clean linen and maintain an orderly work flow.

7.23.C3. An area shall be provided for the sorting, folding and mending of clean linen.

7.23.C4. An area shall be provided for storage of extra stock linens.

7.24 Cart Cleaning Facilities

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 Staff Facilities

Lockers, lounges, and toilet rooms shall be provided for employees and volunteers.

7.26 Housekeeping Rooms

In addition to the housekeeping rooms required in certain departments, sufficient housekeeping rooms consistent with the requirements of Section 2.7.Q shall be provided throughout the facility as required to maintain a clean and sanitary environment. There shall not be less than one housekeeping room for each floor.

7.27 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 elements shall be provided.

- 7.27.A (Not Used)
- 7.27.B Engineer's office with file space and provisions for protected storage of facility drawings, records, manuals, etc.
- 7.27.C General maintenance shop(s) for repair and maintenance of equipment
- 7.27.D Storage rooms separate from mechanical and electrical equipment rooms for building maintenance supplies
- A.7.27.D Storage for solvents and flammable liquids should follow NFPA 30 Flammable and Combustible Liquids or NFPA 56C for labs.
- 7.27.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.F Storage facilities for grounds keeping equipment as per the operational narrative. This may be located in a detached building.

7.28 General Standards for Details and Finishes

- 7.28.A Details
- 7.28.A1 (Not Used)
- 7.28.A2 (Not Used)
- 7.28.A3 Location of items such as drinking fountains, telephones, vending machines, and portable equipment shall not restrict corridor traffic or reduce the corridor width below the minimum standard.
- 7.28.A4 Rooms which contain bathtubs, sitz baths, showers, and/or water closets for patient use shall be equipped with doors and hardware permitting privacy and 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.
- 7.28.A5 (Not Used)
- 7.28.A6 All door openings to rooms needing access for beds or stretchers shall provide a minimum clear opening of 41.5 inches. Door openings to patient toilet rooms and other rooms needing access for wheelchairs shall provide a minimum clear opening of 32 inches.
- 7.28.A7 (Not Used)
- 7.28.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 foot traffic flow at any point in its swing or reduce the required corridor width.
- 7.28.A9 Windows and outer doors that frequently may be left open shall be equipped with insect screens.
- 7.28.A10 Patient rooms or suites in new construction intended for 24-hour occupancy shall have windows. Each required window shall have a bottom of glass elevation not higher than 3'- 0" above finished floor and shall be above grade. In rooms requiring windows, the clear glass area of the windows shall be a minimum of 10 percent of the required floor area of the room. A clear unobstructed viewing distance of 20 feet plus one foot for each 2 foot rise above each floor up to a maximum of 40 feet shall be provided in line with the head of the patient(s) beds. The building may step back

on a floor-by-floor basis to provide the desired line of sight. Windows within a normal sight line that would permit observation into a room shall be arranged or draped to provide for patient privacy.

- 7.28.A11 Windows shall be designed to prevent accidental falls when open, or shall be provided with security screens where deemed necessary by the operational narrative.
- A.7.28.A11 Windows in involuntary admission units, secured holding rooms, or memory loss units can be fabricated of laminated safety glass or equivalent to prevent elopement or falls. These windows should be constructed and installed to not allow more than a 4 inch diameter sphere to pass, or allow for the glazing to pop out and for the frame and sash to remain intact from a 500 pound impact.
- 7.28.A12 (Not Used)
- 7.28.A13 Thresholds and expansion joint covers shall be flush with the floor surface to facilitate the use of wheelchairs and carts.
- 7.28.A14 Grab bars shall be provided at each patient water closet, shower, bathtub, and sitz bath at a wall clearance of 1-1/2 inches. Bars, including those which are part of fixtures such as soap dishes, shall be sufficiently anchored to sustain a concentrated load of 250 pounds.
- 7.28.A15 (Not Used)
- A.7.28.A15 Consideration should be given to shower curtain rods, robe hooks, and towel bars or rings which may be momentarily used for support.
- 7.28.A16 Mirrors shall not be installed at handwashing fixtures 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.A17 (Not Used)
- 7.28.A18 (Not Used)
- 7.28.A19 (Not Used)
- 7.28.A20 The minimum ceiling height shall be 7 feet 10 inches, with the following exceptions:
- a. Ceilings in storage rooms and toilet rooms shall be not less than 7 feet 6 inches in height. Ceiling heights in small, normally unoccupied spaces may be reduced.
 - b. 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 above the floor. Clearances in other areas may be 6 feet 8 inches and applies to the lowest fixed point of ceiling mounted surgical lights; overhead rails/cables in diagnostic and therapeutic radiology rooms, and ceiling/wall mounted televisions under potential footpaths.
- A.7.28.A20 Boiler rooms should have ceiling clearances not less than 2 feet 6 inches above the main boiler header and connecting piping.
- 7.28.A21 (Not Used)
- 7.28.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 above ambient room temperature.

- 7.28.A23 The noise reduction criteria shown in Table 1 shall apply to partitions, floors, and ceiling construction in patient areas.
- 7.28.A24 Eyewash facilities and emergency showers meeting the design specifications of the American National Standards Institute ANSI Z358.1-1990 shall be provided in all areas where injurious or corrosive materials are handled.
- A.7.28.A24 The location and placement of eyewash and/or emergency showers is generally dictated by safety concerns and enforced by the Michigan Occupational Safety and Health Administration (MIOSHA). The Michigan Occupational Health MIOSHA Program Directive No. 93-4 details these requirements when handling injurious corrosives and identifies by pH those chemicals considered to be highly corrosive. Also, some chemical by nature are able to cause tissue damage. This directive adopts the eyewash design specification of ANSI z358.1 1990. HFES has also produced a Bulletin clarifying eyewash requirements found in the MIOSHA directive.
- Note that MIOSHA has not yet adopted any later versions of ANSI Z358.1. The requirement to provide tepid water for eyewash and emergency showers appeared first in the 1998 version of ANSI Z358.1. ANSI does not specify a temperature range for tepid water but an appendix states that temperatures over 100 F can be harmful to the eyes and 60 F is a suitable lower parameter. Limiting the temperature helps protect against eye damage from chemicals that can become more active and more harmful at the higher temperatures. There are also references to ranges of 65 F to 90 F in the eyewash manufacturers' product literature. Until MIOSHA starts referencing later versions of ANSI Z358.1 they will continue to accept eyewash installations plumbed to cold water in most circumstances. It should be noted that the 2003 Michigan Plumbing Code requires installations of eyewash and emergency showers to comply with ANSI Z358.1-1998.
- The main chemicals of concern in a health care facility would be those caustic compounds of a pH of 9.0 or greater and those acid compounds of a pH of 4.0 or less in solution. Many cleaning chemicals in concentrated form and chemicals used as high level disinfectants would be classified as injurious corrosives. Typical injurious corrosives include formaldehyde, glutaraldehyde, and even household bleach. Locations where injurious corrosives are handled (i.e. where emergency eyewash and/or drench showers would be required) would include housekeeping or maintenance chemical storage rooms, laboratory, dialysis reuse rooms, dialysis treatment areas, and areas where Formalin or glutaraldehyde may be used such as Endoscopy, Central Sterile Processing, Ultrasound, Histology, Morgue, and possibly Radiology or Surgery.
- As designated in the ANSI standard 358.1 – 1990, a suitable eyewash/shower facility must be clearly marked, well lighted, and easily accessible (i.e. no obstacles, closeable doorways, or turns). The MIOSHA Directive clarifies that the eyewash and/or emergency shower must be located within 100 feet of the hazardous operation (within 25 feet for highly corrosive chemicals or chemicals capable of causing severe tissue damage). The ASNI standard does not specify distance but specifies that the eyewash/shower must be reachable within 10 seconds and able to be activated with a simple operation within 1 second. The eyewash stations must be able to flush both eyes simultaneously and allow hands free operation once the unit is activated (i.e. a “stay open” feature) so that the user can hold their eyelids open. The availability of these features on a faucet mounted eyewash would determine its acceptability as a bone fide “suitable” eyewash unit. Some safety inspectors feel that if the eyewash unit requires two motions to activate that it is too complex and can not be activated within 1 second, although there is currently no formal prohibition against the two motion eyewash (i.e. one motion to turn on the water, the other motion to pull the diverter valve).
- One rule of thumb would be to read the warning label on the chemical container and if the warning recommends flushing of the eyes for 15 minutes, then an eyewash station is required where the concentrated form of the chemical is handled. A better way is to identify the pH of the product and/or note if the MSDS lists tissue damage as one of the hazardous properties. Note that the small “pint sized” portable eyewash bottles do not supply the minimum 0.4 gallon per minute for 15

minutes (i.e. min 6 gal) as required by MIOSHA. The larger self-contained eyewash units meet this requirement and have the advantage that they do not need to be tested weekly. The water in the portable units typically has an added preservative so that the water need only be changed every 4 months (some products may preserve up to 6 months). Note that the weekly activation requirement for emergency eyewash and showers is to clear the supply line of sediment built-up and minimize microbial contamination (particularly an amoeba that can cause blindness)

It should be noted that the 15 minute flush eyewash requirements apply to injurious corrosives and not to other situations such as splashes in the eye from blood and body fluids. Standard emergency room protocol for such incidents involve use of a one liter bottle of saline to flush the eyes or affected area.

Note that the Michigan Plumbing Code requires eyewash stations to be served by tempered water.

The need for an emergency shower in addition to an eyewash station would be determined by evaluating the amount of product handled and the potential for a splash to the body requiring quick drenching.

- 7.28.A25 Any fixed horizontal surface more than 68 inches above the floor shall be enclosed by a soffit or bulkhead to the ceiling above, or provided with a sloped top (minimum 1 to 3 vertical to horizontal) in all patient, clinical and food preparation areas.
- 7.28.A26 Furniture and equipment which are not easily moved by housekeeping personnel, and where sufficient access is not provided to permit cleaning under and behind the unit, shall be sealed against the floors and adjoining walls. These items include, but are not limited to, file cabinets, work counters, wardrobes, desks, ventilating hoods in laboratories and pharmacies, and storage cabinets.
- 7.28.A27 Equipment such as refrigerators, medicine and clean supplies dispensing units, kitchen equipment and similar types of furnishings shall be installed so that it can be routinely moved for cleaning.
- A7.28.A27 When any equipment or furniture is installed which will be difficult to clean, the facility should be required to submit a step-by-step cleaning procedure for approval.
- 7.28.A28 Equipment typically found in various imaging special procedure, nuclear medicine, and cardiac catheterization procedure rooms, including but not limited to electrical cabinets, floor mounted tables and gantries, exposed cabling and trays, conduits, and transformers shall comply with 7.28.A25 to 7.28.A27 or be located outside the patient treatment rooms in separate mechanical or electrical rooms.
- 7.28.A29 Light fixtures (including indirect and recessed light fixtures) in patient areas shall be equipped with lens covers for safety and to facilitate cleaning.
- A.7.28.A29 Protective shields are to be designed to contain glass fragments in the event of accidental breakage. Shatter resistant lamps that are specially coated meet this requirement. Carpeted public areas such as lobbies, offices, gift shops and other similar areas are exempt.
- 7.28.A30 Building elements, including radiant heating units, shall be designed so that the exposed surface temperature does not exceed 125 degrees Fahrenheit.
- 7.28.B** Finishes
- 7.28.B1 (Not Used)
- 7.28.B2 (Not Used)
- 7.28.B3 (Not Used)

7.28.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 non-slip surface. The floors and perimeter bases of kitchens, soiled workrooms, and other areas subject to frequent wet cleaning shall also be homogeneous, but may have tightly sealed joints.

A.7.28.B4 Aesthetic considerations related to stains and odor control support recommendations to avoid carpeting in areas of frequent spillage or heavy soiling (e.g., OR, obstetrics, ICUs, kitchens, laboratories, chemotherapy units, toilet rooms, utility rooms, or specific pediatric areas).

7.28.B5 In new construction or major renovation work, the floors and perimeter bases of all operating rooms, minor surgical procedure room, cystoscopy, urology, and delivery rooms used for caesarean sections shall be monolithic and joint free.

7.28.B6 Wall finishes shall be washable. In the vicinity of plumbing fixtures, wall finishes shall be smooth and water-resistant.

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, isolation rooms, and sterile processing rooms, wall finishes shall be smooth and free of fissures, open joints, or crevices that may retain or permit passage of dirt particles.

7.28.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.B8 Ceilings shall be provided in areas normally occupied by inpatients, in service areas as listed in Section 2.7, dietary, pharmacy, central services, and lab and shall be cleanable with routine housekeeping equipment.

Ceiling finishes in operating, delivery, isolation, protective environment, sterile processing, interventional radiology, autopsy, sterile compounding, and film processing rooms shall be smooth, scrubable, non-absorptive, non-perforated, capable of withstanding cleaning with chemicals, and without fissures 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. Perforated, tegular, serrated cut, or highly textured tiles are not acceptable.

In psychiatric patient rooms, toilet, and seclusion rooms, ceiling construction shall be monolithic to inhibit possible escape or suicide. Ceiling mounted air and lighting devices shall be security type and fire suppression heads shall be of concealed type.

7.28.B9 (Not Used)

7.28.B10 Radiation protection for X-ray and gamma ray installations shall be in accordance with Michigan Public Code Act 368, part 135 Radiation Control.

A.7.28.B10 Testing in accordance with NCRP 147 will be accepted as compliant with these rules.

7.29 Design and Construction, Including Fire-Resistant Standards (Not Used)

A.7.29 An emergency-radio communication system should be provided in each facility. This system should operate independently of the building's service and emergency power systems during emergencies. The system should have frequency capabilities to communicate with state

emergency communication networks. Additional communication capabilities will be 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. Unless specifically approved, hospitals should 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 should be made to ensure continuous operation.

7.30 Special Systems

7.30.A (Not Used)

7.30.B 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.

7.30.B1 The following number of elevators shall be provided:

- a. At least two elevators shall be installed when 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.
- b. For hospitals with more than 200 beds, the number of elevators shall be determined from a study of the hospital plan and the expected vertical transportation requirements.

7.30.B2 Elevator cars shall have inside dimensions that accommodate a patient bed with attendants and be at least 5 feet 8 inches wide by 9 feet deep. Car doors shall have a clear opening of not less than 4 feet wide and 7 feet high. In renovations, existing elevators that can accommodate patient beds used in the facility will not be required to be increased in size.

A.7.30.B2 Additional elevators installed for visitors and material handling are permitted to be smaller than noted above, within restrictions set by standards for disabled access.

In new construction, hospital-type elevator cars should have inside dimensions for accommodating a patient bed with attendants and equipment. Bed sizes vary depending on the type of patient served and the accessories attached to the bed. Therefore, the inside clear cab dimensions and door width should accommodate the most size-demanding type of patient bed, equipment, and staff determined by the operational narrative.

7.30.B3 (Not Used)

7.30.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.B5 (Not Used)

7.30.B6 (Not Used)

7.30.C Waste Processing Services

Facilities shall be provided for sanitary storage and treatment or disposal of waste using techniques acceptable to the appropriate health and environmental authorities. The operational narrative shall stipulate the categories and volumes of waste for disposal and shall stipulate the methods of disposal for each.

The design and construction of trash chutes shall comply with NFPA 82.

A.7.30.C The Medical Waste Regulatory Act of 1990, Act No. 368 of the Public Acts of 1978, as amended, Part 138, Medical Waste, regulates disposal of medical waste.

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 Mechanical Standards

7.31.A General

7.31.A1 The HVAC systems shall be designed as fully ducted to achieve and meet occupancy comfort conditions in accordance with Tables 2A and 2B and filtration efficiencies in accordance with Table 3.

A.7.31.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 should 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 should 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 Existing HVAC equipment serving remodeled areas shall meet Table 2A and 2B standards and Table 3 filtration efficiencies. The existing supply, return, and exhaust duct systems serving the remodeled areas shall be cleaned inside and properly sealed.

A.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 should be given to additional work that may be needed to achieve this. Heating, ventilating, and air conditioning systems should meet the needs of the facility and the design requirements in Tables 2A and 2B. Existing lined supply air ducts serving the remodeled areas should be replaced with new unlined supply air ducts. The remodeled areas of the existing facility should be brought up to energy efficient standards, such as insulation and thermal pane windows.

7.31.A3 (Not Used)

A.7.31.A3 Facility design consideration should include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.

7.31.A4 Where installed, HVAC energy recovery devices must be properly designed, installed and maintained to ensure separation between the incoming and exhaust air streams and prevent reintroduction of potentially contaminated air into the fresh air supply. The supply and exhaust air fans must be properly sized and placed to prevent introduction of contaminants from the exhaust air stream from entering the HVAC system. The static pressure of the supply air stream shall always be greater than the exhaust air stream. In the event of a device failure, air must always flow from clean to less clean. Final air filters must be located downstream of an energy recovery device. Energy recovery devices shall not be used in contaminated exhaust air streams such as airborne infection isolation rooms, pharmacy cytotoxic hoods, laboratory hoods, and other similar exhausts that may contain toxic fumes or infectious materials.

A.7.31.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.) Air to water type heat exchangers are permitted. Typically, the supply air fan must be located

upstream (blow-through) of the energy recovery device and, the exhaust fan must be located downstream (draw-through) of the device.

7.31.A5 (Not Used)

A.7.31.A5 Facility design consideration should 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.

7.31.A6 (Not Used)

A.7.31.A6 Air-handling systems should be designed with an economizer cycle, where appropriate, to use outside air. (Use of mechanically circulated outside air does not reduce need for filtration.)

7.31.A7 Vibration isolators shall be used for HVAC equipment, duct work, and piping to isolate vibration and noise from transmitting to the facility's structure.

A.7.31.A7 Mechanical equipment, ductwork, and piping should be mounted on vibration isolators, as required to prevent unacceptable structure-borne vibration. Air handling units should be designed with appropriate traps, appropriately sized drains or other engineered systems to prevent problems with excess water and flooding of units.

7.31.A8 (Not Used)

A.7.31.A8 Sound pressure levels from mechanical systems should not exceed 60 dBA in patient rooms or 70 dBA all other areas occupied by patients. Permanent hearing loss can result from continued neonate exposure to more than 70 dB or adult exposure to 85 dBA and high background noise levels can impede communication. However neonates are normally sheltered by their incubator and a level of sound masking can be beneficial to allow for patients to rest.

7.31.B Thermal and Acoustical Insulation

7.31.B1 Insulation for HVAC systems shall be provided for piping, equipment, and duct work to conserve energy, protect personnel, prevent condensation, and reduce noise.

7.31.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.

7.31.B3 (Not Used)

A.7.31.B3 Insulation/lining, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, should 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 consistent with NFPA 255. The smoke development rating for pipe insulation should not exceed 150. This includes mechanical refrigeration and distribution equipment such as valves, pumps, chillers, etc.

7.31.B4 Where existing lined exhaust and return air ductwork is reworked in a renovation project, the liner seams and punctures shall be resealed or replaced. If duct lining is used, it shall be coated and sealed, and shall meet ASTM C1071. Existing lined supply air ducts serving remodeled areas shall be replaced with new unlined supply air ducts.

A.7.31.B4 These linings (including coatings, adhesives, and exterior surface insulation on pipes and ducts in spaces used as air supply plenums) should 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 consistent with NFPA 255. HVAC linings including coatings, adhesives, and exterior surface insulation on pipes

and ducts in spaces used as supply plenums, should have a flame spread rating of 25 or less and a smoke-developed rating of 50 or less consistent with NFPA 255.

7.31.B5 Duct linings exposed to air movement shall not be used in new supply ducts. This requirement does not apply to mixing boxes and acoustical traps that have special coverings over such lining.

7.31.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.

A.7.31.C1 The capacity of the remaining boiler(s) should 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.

7.31.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 emergency service.

7.31.C3 Supply and return mains and risers shall be equipped with valves at each branch from the main. Each piece of equipment shall have valves at the supply and return ends.

7.31.C4 Emergency fuel shall be provided for boilers. The fuel storage capacity shall be adequate to meet the operational needs of the facility for the same time period as emergency power.

A.7.31.C4 The hospital must have a system to provide emergency fuel as needed to provide care to inpatients and other persons who may come to the hospital in need of care. This includes making arrangements with local utility companies and others for the provision of emergency sources of fuel. The hospital should consider nationally accepted references or calculations made by qualified staff when determining the need for fuel. Emergency fuel includes fuels such as propane, natural gas, fuel oil, liquefied natural gas. The hospital should have a plan to protect these limited emergency supplies, and have a plan for prioritizing their use until adequate supplies are available. The plan should also address the event of a disruption in supply (e.g., disruption to the entire surrounding community).

7.31.D Air Conditioning, Heating, and Ventilation Systems

7.31.D1 The ventilation system for the space shall be adequate to maintain the space condition based on space load requirements but be no less than the requirements of Tables 2A and 2B. Table 3 filtration efficiencies shall also be used. Airflow shall be controlled and maintained to ensure movement of air from clean to less clean areas.

All rooms used for patient care shall be temperature controlled and shall comply with the standards set in Table 2B.

A.7.31.D1 Private patient rooms may be provided with temperature control adjustments near the bed area, accessible to the patient. In order to maximize occupant comfort, individual room temperature control is recommended. This is of greater importance for inpatient rooms as often patients have difficulty regulating their own body temperature. Final ventilation rates in clinical areas should be

within 10% of approved design values as documented at time of opening survey by submittal of an air balance report that has been approved by the project designer.

7.31.D2 Exhaust systems serving patient care areas shall be fully ducted with the exhaust fan located at the discharge end of the system, and shall be located to provide serviceability. Plenum return systems are prohibited in patient care areas.

A.7.31.D2 Exhaust systems may be combined to enhance the efficiency of recovery devices required for energy conservation. Exhaust air from isolation rooms should not be connected to local exhaust systems. Local exhaust systems should be used whenever possible in place of dilution ventilation to reduce exposure to hazardous gases, vapors, fumes, or mists.

7.31.D3 Outdoor air intakes (other than combustion air intakes) shall be located at least 25 feet from hazardous exhaust outlets such as autopsy rooms, airborne infectious isolation rooms, ethylene oxide discharges, patient decontamination, chemotherapy hoods, laboratory hoods, radiopharmacy hoods, combustion gases (natural gas and propane excluded), or areas that may collect vehicular exhaust or other noxious fumes. The bottom of outdoor air intakes serving central systems shall be as high as practical, but at least 6 feet above ground level, or, if installed above the roof, 3 feet 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.

All outdoor air intakes (other than combustion air intakes) shall also be located at least 10 feet from exhaust fans, medical vacuum discharges, or plumbing vents.

Packaged air handling units and relief air are exempt from these separation requirements from their own combustion vent.

Exhaust outlets located in equipment wells that include outdoor air intakes (other than combustion air intakes) and are enclosed on three or more sides shall terminate 3 feet above the highest side or terminate at the highest wall height with vertical discharge velocity of at least 1,000 feet per minute. The above separation requirements also apply.

A.7.31.D3 Prevailing winds and/or proximity to other structures may require greater clearances. Note that the above specified separation of outdoor air intakes from exhaust outlets is a minimum. Greater distances may be needed where the possibility exists for entrainment of exhaust from emergency generators, ambulance areas, etc. Refer to DHHS (NIOSH) publications 2002-139 and 2003-136 for protecting from airborne attacks. Reduction in the 25 foot separation requirement would be based on use of upblast exhaust fans and accepted engineering practice such as demonstration of compliance with ASHRAE standard 62.1 – 2004. Note that other agencies may require 25 foot separation for all instances. Exhaust fans handling hazardous discharges should be so labeled.

7.31.D4 In new construction and major renovation work, air supply for operating and delivery rooms and major invasive procedure rooms, such as cardiac catheterization labs and angiography rooms, shall be from ceiling diffusers near the center of the work area. Return and exhaust grilles shall be near the floor level. Each operating and delivery room shall have at least two return or exhaust grilles located as remotely from each other as practical.

A.7.31.D4 Atmospheric contamination has been found to be reduced when the thermal plume that naturally develops from the surgical (wound) site is not disrupted. Ceiling mounted non-aspirating (perforated) diffusers, with a face velocity between 25 and 35 fpm that extend beyond the area of the footprint of the operating table have been found to work best. This information can be obtained from studies conducted by the National Institutes of Health, titled "Comparison of Operating Room Ventilation Systems in the Protection of the Surgical Site", ASHRAE Transactions, V.108, Pt.2, 2002 (Memarzedeh F and Manning A) and "Effect of Operation Room

Geometry and Ventilation System Parameter Variations on Surgical Site, IAQ 2004 (Memarzadeh F and Jiang Z).

The use of portable HEPA filtered recirculating ventilation units have been shown to possibly increase the risk of contamination by disturbing proper air flow patterns in operating rooms.

- 7.31.D5 (Not Used)
- A.7.31.D5 Air handling equipment equipped with air cooling coils should be provided with drain pans to collect the condensation from the coils. Condensate drains should be piped to the outside of the air handling units. All individual condensate drains should be provided with traps which should then be piped to discharge into the nearest drain. The depth of the condensate drain traps should be sufficient to overcome the operating static pressure of the air handling unit.
- 7.31.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. Waste Anesthesia Gas Disposal (WAGD) shall comply with NFPA 99.
- A.7.31.D6 Smoke Evacuation Systems should be used during procedures using a laser or electrosurgical unit. The thermal destruction of tissue creates a smoke (plume) byproduct. This smoke or plume is thought to be hazardous to healthcare workers. The smoke evacuation system must be adequate to handle the amount of plume produced during surgical procedures. In-line suction filters may be used for small amounts of plume (e.g., for microlaryngoscopic vaporization of vocal cord polyps). A smoke evacuation system with an evacuation hose will be used for large amounts of plume.
- 7.31.D7 The bottoms of ventilation (supply/return) openings shall be at least 6 inches above the floor.
- 7.31.D8 All central ventilation or air conditioning systems shall be equipped with filters with efficiencies equal to, or greater than, those specified in Table 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 shall be tested consistent with Minimum Efficiency Reporting Value (MERV) ASHRAE 52.1-92. 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 or other means to monitor pressure differential shall be installed across each filter bed having a required efficiency of MERV 12 or more including hoods requiring HEPA filters meeting the hot DOP test.
- 7.31.D9 If humidifiers are located upstream of the final filters, they shall be located at least 15 feet 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.
- A.7.31.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.
- Use of steam-to-steam heat exchangers is recommended for steam humidification. This type of system prevents introducing harmful boiler additives into HVAC from direct steam injection because the boiler steam is used to generate clean steam from water without any chemical

additives. Electrical steam generation is also possible to produce clean steam. If direct steam injection of boiler steam is used to provide humidification, then only FDA-approved boiler additives can be used in the boilers.

- 7.31.D10 Air-handling duct systems shall be designed with accessibility for duct cleaning and shall meet the requirements of NFPA 90A.
- 7.31.D11 (Not Used)
- A.7.31.D11 Ducts that penetrate construction intended to protect against X-ray, magnetic, RFI, or other radiation should not impair the effectiveness of the protection.
- 7.31.D12 Provide a Class II, type B, or Class III Biological Safety Cabinet where cytotoxic agents are prepared.
- 7.31.D13 Hoods and safety cabinets shall not be used as the sole means for normal exhaust of a space. If air change standards in Table 2A 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 make-up air will avoid dependence upon infiltration from outdoor and/or from contaminated areas. Make-up air 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.D14 Laboratory hoods shall comply with following general standards:
- a. Provide an average face velocity of 100 fpm (feet per minute) with no point less than 85 fpm.
 - b. Be connected to an exhaust system to the outside which is separate from the building exhaust system. No recirculation or transfer of lab air to other spaces is allowed.
 - c. Have an exhaust fan located at the discharge end of the system, with the exhaust duct under negative pressure. Keep discharge duct, located inside building, as short as possible and sealed leak free. Arrange outdoor air discharge to minimize re-entrainment of exhaust air.
 - d. Have an exhaust duct system of noncombustible corrosion-resistant material, as needed to meet the planned usage of the hood.
- A.7.31.D14 Laboratory hoods should comply with NFPA Standard 45, American National Standard for Laboratory Ventilation, ANSI/AIHA Z9.5, and ASHRAE 110 testing. Design and installation of ventilation equipment for toxic substances should ensure compliance with EPA and/or Michigan Department of Environmental Quality Regulations concerning fugitive air emissions, air permits, and other applicable environmental health and safety regulations. Typical sources of air emissions in health care facilities include incinerators, boilers, and ethylene oxide sterilizers.
- 7.31.D15 Laboratory hoods shall meet the following special standards:
- a. (Not used)
 - b. In new construction and major renovation work, each hood used to process infectious or radioactive materials shall have a minimum average face velocity of 100 fpm with no point less than 85 fpm. Use suitable pressure-independent air volume control devices to maintain a constant air volume. Provide each hood with a face velocity monitoring and low airflow alarm system to alert staff of fan shutdown or loss of airflow. The monitoring device shall include an airflow volume readout, normal and unsafe lights, and an alarm horn with silencer. 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. The HEPA filter system shall include arrangement and devices to allow in-place DOP test certification. Filters shall be as close to the hood as practical to minimize duct contamination.

- c. 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.

A.7.31.D15 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.

Consider using variable volume laboratory fume hoods where multiple hoods are located in a space or area. A flow tracking system is recommended that will allow the space make-up air to be controlled to maintain the room negative pressure and maintain the appropriate air change rate at all times. A minimum laboratory fume hood inflow rate of 25 percent of maximum inflow rate is recommended, when hood sash is fully closed.

7.31.D16. (Not Used)

7.31.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.

7.31.D18 The ventilation system for the space that houses ethylene oxide (ETO) sterilizers shall be designed to:

- a. Provide a dedicated (not connected to a return air or other exhaust system) exhaust system compliant with section 304 of the Michigan Occupational Safety and Health Act 154, R 408.1001 et seq., of the Michigan Compiled Laws.
- 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. An audible and visual alarm shall activate in the sterilizer work area, and a 24-hour staffed location, upon loss of airflow in the exhaust system.

7.31.D19 (Not Used)

7.31.D20 Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit work station temperatures.

7.31.D21 (Not Used)

7.31.D22 (Not Used)

7.31.D23 Special consideration shall be given to the type of heating and cooling units, ventilation outlets, and appurtenances installed in patient seclusion and psychiatric rooms. 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.D24 All cough inducing procedures performed on patients who may have infectious Mycobacterium Tuberculosis shall be performed in booths or special enclosures with discharge HEPA filters or exhaust directly to the outside. These procedures may also be performed in a room that meets the ventilation requirements for airborne infection control. See Table 2A for ventilation requirements.

A.7.31.D24 When not performed in an airborne infection isolation room, sputum induction should be performed in an enclosed booth, with a mechanical ventilation system capable of providing at least 20 air changes per hour. The exhaust rate should be at least 125 cfm, and the space should be under negative pressure and at least 0.01" water column pressure differential. The booth should contain a grille to provide make-up air that should enter with a velocity of at least 100 fpm. All air should be exhausted directly to the outside. HEPA filtration of the exhaust may be required, if the exhaust point is near an outside air intake, or pedestrian area.

7.31.D25 Individual room units that are used for heating and cooling purposes (fan coil units, heat pump units, etc.) shall be equipped with filters that comply with MERV 8 standards. These units may be used as recirculating only and serve only a single room. All outdoor air requirements shall be met by a separate central air handling system with the proper filtration, as noted in Table 3.

7.31.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 (MERV 17) in the supply air stream. 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 shall be provided. Rooms with reversible airflow provisions for the purpose of switching between protective environment and airborne infection isolation functions are not acceptable.

7.31.D27 (Not Used)

A.7.31.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 devices do not provide the outside air requirements or temperature control. Rooms with reversible airflow provisions for the purpose of switching between protective environment and AII functions are not acceptable. Air may be recirculated within individual isolation rooms if HEPA filters are used.

7.31.D28 Critical Environments such as airborne infectious isolation rooms and operating rooms shall have a minimum differential pressure of 0.01 inches water gauge and minimum differential air flow of 125 cfm. The exhaust from the toilet room serving these rooms may be credited towards this differential. Refer to Table 2A and associated footnote 2.

A.7.31.D28 Continuous pressure monitoring devices are not required for infectious isolation rooms, although the JCAHO would still require them since they are a requirement in the national AIA guidelines that has been adopted by JCAHO.

If installed, the pressure alarm monitoring ports should be installed in the patient room and in any adjacent room or corridor with a communicating door with a separate alarm for each door. When there is an ante room, the pressure alarm monitor ports may be placed in the patient room and the ante room. Pressure monitors should have both audible and visual warning with time delay feature. The visual warning should be capable of remaining functional even if the audible alarm is silenced.

Where possible, the pressure measuring device should sense the pressure just inside the air flow path into the AII room (e.g. at the base of the door) although pressure ports at ceiling or mid-height would be acceptable provided monthly smoke trail testing (or equivalent) at the door undercuts is being performed.

The verification of airflow direction can include a simple visual method such as smoke-trail, ball-in-tube, or flutter strip. Note that even with continuous pressure monitors, verification of airflow direction must still be performed 1) monthly and 2) daily when the room is in use by a suspect or confirmed M. tuberculosis patient.

The smoke trail test should be conducted at all door openings between the patient room and adjacent rooms (except toilet room and closet serving that patient room). If there is an ante room, OSHA guidance (Appendix G to 1910.1035) instructs test to be done at the inner door undercut with both ante room doors shut. The guidance also recommends 1) releasing the smoke at all door entrances to the isolation rooms or areas with the doors shut, 2) releasing the smoke parallel to the doorway so that the test does not inadvertently force the smoke into the isolation room or area, 3) release the smoke 2 inches out in front of the door, 4) perform the smoke trail (or equivalent) test to reflect all as-used conditions: a) if there is a toilet room adjacent to the patient room, perform the tests with both the toilet room door closed and open. This would not be necessary if the toilet room door is normally closed and controlled in that position with a door closer. b) if there is an openable window, test with the window open and closed, c) if there are nearby cross-corridor doors, test with the doors in their “as-used” positions. Note: If the room is served by a VAV system test with the thermostat set at the desired temperature and again with the thermostat set at both the max or min position to simulate full volumetric range of VAV flow.

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 positioned between the infectious source and the exhaust location. The design of such systems should also allow for easy access for scheduled preventive maintenance and cleaning.

It is recommended that air systems that may reasonably be anticipated to contain aerosolized M. tuberculosis must be labeled at all points where ducts are accessed prior to a HEPA filter and at duct access points, fans, and discharge outlets of non-HEPA filtered direct discharge systems. Warning language such as “Contaminated Air – Respiratory Protection Required” or similar should be used. According to CDC, the intent of the warning provisions is to assure that employees who may be accessing these systems for the purpose of activities such as maintenance, replacement of filters, and connection of additional ductwork are warned of the presence of air that may contain aerosolized M. tuberculosis so that appropriate precautions can be taken. See the “CDC Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities, 2005.”

7.31.E Plumbing and Other Piping Systems

Unless otherwise specified herein, all plumbing systems shall be designed and installed in accordance with the authority having jurisdiction.

- 7.31.E1 (Not Used)
- 7.31.E2 The following standards shall apply to potable water supply systems:
- a. (Not Used)
 - b. Each water service main, branch main, and riser shall have valves. Stop valves shall be provided for each fixture. Access shall be provided at all valves.
 - c. The potable water supply shall be designed, installed and maintained to prevent contamination from non-potable liquids, solids or gases being introduced into the potable water supply through cross connections.
 - 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.
- 7.31.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 4. Water temperature is measured at the point of use or inlet to the equipment.
 - b. Hot water distribution systems serving patient care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet. The temperature of hot water at point of discharge for bathing fixtures and handwash lavatories shall be maintained between 105 and 120°F.
 - c. The maximum developed length of domestic hot water runs without a return shall be limited to 60 feet.
 - d. Dead end piping (risers with no flow, branches with no fixtures) shall not be installed, except for water hammer arrestors. In renovation projects, dead end piping shall be removed to within 6 inches of active lines. Empty risers, mains, and branches installed for future use shall be permitted.
- A.7.31.E3 Point of use thermal mixing valves can prevent achieving the minimum required hot water temperatures at scrub sinks, showers, tubs, and other fixtures.
- 7.31.E4 The following standards shall apply to drainage systems:
- a. (Not Used)
 - b. (Not Used)
 - c. Insofar as possible, drainage piping should 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 should 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 non-splash, 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. (See Section 3.1.D)

A.7.31.E4 Floor drains in cystoscopy operating rooms have been shown to disseminate a heavy 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 a floor drain is insisted upon by the users, the drain plate should be located away from the procedure 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).

Drain lines from sinks used for acid waste disposal shall be made of acid resistant material.

Drain lines serving some types of automatic blood cell counters 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.

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.

Where plaster traps are used, provisions shall be made for appropriate access and cleaning.

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 (such as ice machines) and as required for wet cleaning of floors. 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.E5 The installation, testing, and certification of nonflammable medical gas and air systems shall be installed in compliance with the requirements of NFPA 99. Manual bypass to computer based controls used to control medical air compressors is allowed.

(See Table 5 for rooms requiring station outlets.)

A.7.31.E5 Note that in determining the need and location for medication gas alarms not every room equipped with nitrous oxide is considered an anesthetizing location. Often the use of an anesthesia cart in various procedure rooms is for pain management or conscious sedation.

7.31.E6 Clinical vacuum system installations shall be installed in compliance with NFPA 99. Manual bypass to computer based controls used to control medical vacuum is allowed.

(See Table 5 for rooms which require station outlets.)

7.31.E7 All piping, except control-line tubing, shall be identified. All service main, branch main, and riser valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.

7.31.E8 (Not Used)

7.31.E9 Provide condensate drains 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.

7.32 Electrical Standards

7.32.A General

7.32.A1 All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed consistent 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.

7.32.A2 (Not Used)

7.32.A3 (Not Used)

A.7.32.A3 A design should be provided such that power sources such as shielded isolation transformers, voltage regulators, filters, and the like are not required elements of the design. Ensure that the equipment meets ANSI/IEEE standard 602-1996, IEEE Recommended Practice for Electric Systems In Health Care Facilities (White Book) and ANSI/IEEE standard 446-1995, IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications (Orange Book).

7.32.A4 (Not Used)

A.7.32.A4 For new facilities or major additions/renovation projects at least two primary electrical feeds served from separate substations or on-site back-up electrical source with 24 hour fuel supply to serve the entire facility demand should be considered.

7.32.A5 (Not Used)

A.7.32.A5 The electrical installations, including alarm, nurse call, and communication systems should 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 should show compliance with applicable codes and standards. In addition to this testing, the electrical design professional should conduct and submit to the owner and local authority having jurisdiction, the following studies: Short Circuit Study, Equipment Evaluation Study and Protective Device Coordination Study.

7.32.B Services, Switchboards, Panelboards and Transformers

Main switchboards, panelboards and transformers shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only.

Switchboards, panelboards and transformers shall be convenient for use, readily accessible for maintenance, 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.

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 circuits may also serve floors above and/or below.

A.7.32.B Disconnects or electrical panels should be remotely located from any potentially hazardous equipment including boilers, sterilizers, and generators being served to allow for the safe shutdown of the equipment.

- 7.32.C** Panelboards (Not Used)
- 7.32.D** Lighting
- 7.32.D1 Lighting shall meet or exceed the minimum illumination levels listed in Table 8.
- 7.32.D2 (Not Used)
- 7.32.D3 Patient rooms and adjacent toilet 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 produce heat shall be avoided to prevent burns to the patient and/or bed linen. Flexible light arms, if used, shall be mechanically controlled to prevent the lamp from contacting the bed linen. Lighting for coronary and intensive care bed areas shall permit staff to observe the patient while minimizing disturbances to the patient.
- At least one wall mounted night light fixture location near the floor in the pathway toward the patient toilet room shall be provided for the patient and staff use. This requirement does not apply to intensive care patient rooms where view panels are provided to the corridor.
- A.7.32.D3 The intent of the night light is primarily for the patient use at night without having to turn on an excessive amount of light. Locating a switch for night lighting near the room entrance allows staff to use the light for night observation into the room and may limit disruption to the patient.
- 7.32.D4 Operating and delivery rooms, LDR's and LDRP's shall have general lighting in addition to special lighting units provided at surgical and obstetrical tables or beds. General lighting and special lighting shall be on separate circuits.
- 7.32.D5 Nursing unit corridors shall have general illumination with provisions for reducing light levels at night.
- 7.32.D6 (Not Used)
- A.7.32.D6 Illumination for staff and patient needs should generally comply with health care guidelines set forth in the ANSI/IESNA publication RP-29-06, Lighting for Hospitals and Health Care Facilities. 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). 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.D7 (Not Used)
- A.7.32.D7 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.
- 7.32.D8 A portable or fixed examination light shall be provided for examination/treatment, and procedure rooms consistent with Table 8.
- 7.32.D9 (Not Used)
- 7.32.D10 (Not Used)
- 7.32.D11 Exterior building signage and entrance lights for the Emergency Department must be on emergency power.
- 7.32.D12 Battery powered back-up lighting shall be installed in emergency power generator areas, emergency power transfer switch areas and other areas required by NFPA 70, 101 and NFPA 110.

7.32.D13 Battery powered lighting shall be provided for Operating Rooms, Delivery Rooms, Cardiac Cath Labs, Angiography Labs and Trauma Rooms and other common anesthetizing locations. The battery shall provide illumination for a period of 90 minutes after the loss of normal and emergency power

A.7.32.D13 The required illumination level while on the battery power is not specified. The desired illumination level under battery power should be determined by the individual healthcare institution.

An anesthetizing location is any area of a facility that has been designated to be used for the administration of any flammable or nonflammable inhalation anesthetic agent in the course of examination or treatment, including the use of such agents for relative analgesia. Non-inhalation conscious sedation locations are not considered anesthetizing locations.

It may be prudent to have the charging circuit for the battery powered lighting on the emergency power system. It is also convenient to make provisions for testing the battery powered lighting.

7.32.E Receptacles

A.7.32.E Hospital grade receptacles are required in general and critical care locations in accordance with sections 517.18(B) and 517.19(B)(2) of the Michigan Electric Code.

7.32.E1 Electrical convenience receptacles shall be provided in accordance with Table 9.

A.7.32.E1 NFPA prohibits patient care related use of relocatable power taps (power strips).

7.32.E2 Receptacles may be omitted from exterior walls where construction or room configuration makes installation impractical.

A.7.32.E2 The duplex receptacle on each side of the head of each bed location should be at a level not less than 36 inches and not more than 54 inches above the finished floor. At least one of these receptacles should be connected to the Emergency Power System. There should also be a receptacle at the head of each bed location for the purpose of powering the bed. There should be not less than one receptacle on each wall located at least 18" above the finished floor.

7.32.E3 Duplex receptacles for general use shall be installed approximately 50 feet apart in all corridors and within 25 feet 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 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.E4 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.E5 All electrical receptacles within 36 inches of a plumbing fixture shall be equipped with ground fault interrupting protection.

7.32.F (Not Used)

A.7.32.F 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, Administrative and Public Areas, Medical Records, Central Services, General Stores, and Linen Services. These sections should be consulted to ensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

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.G Hospital Signaling and Nurse Call Equipment

Hospital Signaling and Nurse Call Equipment include the following four types of calling stations:

- Patient Station
- Bath Station
- Emergency Signal Station (Staff Assistance)
- Code Call Station (Code Blue)

The Hospital Signaling and Nurse Call Equipment shall be on emergency power. The system may not suffer any degradation during the transfer from normal to emergency power and upon re-transfer. The Hospital Signaling and Nurse Call Equipment shall be intuitively easy to operate. Refer to Table 10 for required locations of all stations..

A.7.32.G These stations types are defined and described in UL 1069, which is also a useful guideline for various durability and performance criteria.

7.32.G1 Each bed shall be provided with a Patient Station equipped for two-way voice communication. Two call devices serving adjacent beds may be served by one Patient Station. Calls shall activate a visible signal. The Patient Station will have a call assurance lamp, which lights when a call is placed, and reset switch for canceling a call. In rooms containing two or more Patient Stations, call assurance lamps shall be provided at each station. Each Patient station shall be equipped with a call assurance lamp which remains illuminated as long as the voice circuit is operating.

7.32.G2 A Bath Station shall be provided at each patient water closet, bathtub, sitz bath, and shower stall that can be activated by a pull cord that is accessible to a collapsed patient lying on the floor. An alarm in these areas can only be turned off at the Bath Station where it was initiated.

Bath stations in shower stalls and tubs shall be located 5 – 6 feet above the floor, within normal view of the user, and within reach of staff without stepping into the stall or tub. Bath stations shall be located to the side of water closets, within 12 inches of the front of the toilet bowl, and 3 – 4 feet above the floor.

7.32.G3 (Not Used)

7.32.G4 Emergency Signal Stations to summon additional staff assistance shall be provided at each patient/resident bed, stretcher, table, and chair. Combining Patient and Emergency Signal Stations must be justified in the operational narrative.

A.7.32.G4 These stations are intended to summon local assistance usually for non-life-threatening situations. Many hospitals use the telephone system and overhead paging system to comply with this

regulation. This is acceptable as long as this system functions on emergency power and calls are not lost in the transition from normal to emergency power.

7.32.G5 Code Call Stations (commonly referred to as a “Code Blue”) shall be provided within line-of-sight of each specified patient bed, table, and chair. There shall be a continuous audible or visual confirmation to the person who initiated the Code Call. The process and staff who respond to these calls shall be documented per the Operational Narrative.

A.7.32.G5 These stations are meant for use during a life-threatening situation to summon assistance from outside the unit or department. Many hospitals use the telephone system and overhead paging system to comply with this regulation. This is acceptable as long as this system functions on emergency power and calls are not lost in the transition from normal to emergency power.

7.32.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 nurse call hardware shall have tamper resistant fasteners.

7.32.G7 Patient Station, Bath Station, Emergency Signal Station (Staff Assistance), and Code Call Station (Code Blue) shall report to an attended location as described in the operational narrative and Table 10. Where provided master stations shall provide audible/visual prompting and display all pending calls (or if limited display capabilities, display the highest priority calls as described in the operational narrative).

A.7.32.G7 The system should include a priority hierarchy to account for specific patient needs (e.g. non-verbalizing or high fall risk patients).

7.32.G8 Patient stations, bath stations, emergency signal stations, and code call stations shall report to appropriate duty stations locations as specified in Table 10 and as described in the operational narrative. Duty stations shall provide visual and audible annunciation.

7.32.G9 (Not Used)

A.7.32.G9 Alternate technologies can be considered for emergency or nurse call systems. If radio paging systems are utilized, consideration should be given to electromagnetic compatibility between internal and external sources. The operational narrative should consider how the Nurse Call System will operate at different times of the day when operations may change from a decentralized model to a more centralized model.

7.32.H Emergency Electric Service

Emergency power shall be provided consistent with NFPA 99, NFPA 101, and NFPA 110 and shall be capable of providing not less than 72 hours of service at full load.

a. At a minimum all of the following shall be served by essential electrical system:

- As required by NFPA 99 and the Michigan Electrical Code
- Pharmaceutical hoods
- Laboratory hoods
- Radio pharmacy hoods
- Exhaust ventilation serving hot labs where bulk xenon 133 is stored
- Heating plant and needed accessories
- Medical gas/vacuum systems (pumps and alarms)
- Patient telemetry and physiological systems with associated communications systems

- PACS
 - Nurse call systems
 - Defibrillators
 - Patient clinical information systems
 - Automated medication dispensing systems
 - Medication and laboratory refrigeration equipment
 - Organ and tissue refrigeration equipment
 - Ethylene oxide sterilizer ventilation systems
 - Emergency cryogenic venting systems
 - Ventilation of all operating, airborne infection isolation, and protective isolation rooms
 - Ventilation for intensive care rooms and special care nurseries
 - Cooling, power, and lighting, for 10% but not less than one of each operating room, delivery room, trauma rooms, angiography rooms, interventional radiology rooms and cardiac catheterization labs.
- b. At a minimum at least one of each of the following:
- C.T. scanner
 - Radiographic/fluoroscopic imaging unit
- This requirement includes the cooling for the electronic equipment that supports the procedure rooms.
- c. One elevator as defined in Section 7.30.B to each inpatient care floor. Patients must also be able to evacuate all other elevators after the loss of normal power.
- d. All other systems serving functions that are considered essential.

A7.32.H

Emergency power should be provided for cooling for intensive care rooms and special care nurseries.

It is recommended that facilities be designed to be self-sufficient for up to 72 hours following a regional disaster.

Emergency power may be supplied from a “cogeneration” unit(s) provided the following requirements are met:

- a. The cogeneration unit(s) can be brought on line within the time determined by NFPA 99 for Type I systems. Where the portion of the Essential Electrical System being served by this unit(s) is exclusively under a “delayed” reconnection, this provision may be waived.
- b. Where the cogeneration unit(s) is(are) to be used as the emergency source, at the time of a failure of the normal source, the cogeneration unit(s) should immediately disconnect from the “normal” source and transfer to the “emergency” mode.
- c. Fuel for the cogeneration unit(s) should have an on-site supply as deemed appropriate by NFPA 99. Where natural gas is used as the prime firing source, a dual fired combustor using an on-site fuel should be installed as part of the cogeneration unit. This requirement may be waived by the authority having jurisdiction where it is deemed that the natural gas supply is reliable.

- d. Where more than one cogeneration unit feeds the site, they should not be the sole source of normal power for the facility unless there is reserved capacity available through the electrical utility for the site.

The reliance on emergency power in healthcare facilities continues to increase. Equipment and electrical systems on emergency power are escalating equally as fast. It is no longer unusual to find the patient care information system on emergency power.

Because of this increasing demand and reliance on emergency power, it is incumbent on the electrical system designer to anticipate the effect on the healthcare facility of scheduled and unscheduled downtime of the emergency power system.

Consideration should be based upon a risk assessment for each facility. Some facilities may choose a dual electrical buss system, while others may choose to stock critical components. In many cases, the minimum emergency power requirements will be adequate. Regardless of the options, the designer should provide the healthcare facility with the merits and perils of each.

It is strongly recommended that the Electrical Designer and Owner install Bypass-Isolation Switches for emergency power automatic transfer switches (ATS) so maintenance can be performed while they are de-energized on the throw over mechanism without interrupting power to the essential load. Bypass Isolation Switches eliminate downtime for maintenance of the emergency power transfer switches as well as provide an alternate method of transfer in the event the emergency power transfer switches are damaged. Bypass-Isolation Switches are to be installed in accordance with NFPA 99; 4-4.2.1.7

7.32.I Fire Alarms

All health care occupancies should be provided with a fire alarm system consistent with NFPA 101 and NFPA 72.

7.32.J Telecommunications and Information Systems

7.32.J1 Locations for terminating telecommunications and information system devices shall be provided.

7.32.J2 A room shall be provided for central equipment locations. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

Table 1**Sound Transmission Limitations in General Hospitals and Outpatient Facilities**

| | Airborne Sound | |
|--|---|---------------|
| | Sound Transmission Class (STC)^a | |
| | Partitions | Floors |
| <hr/> | | |
| New Construction | | |
| Patient room to patient room | 45 | 40 |
| Public space to patient room ^b | 55 | 40 |
| Service areas to patient room ^c | 65 | 45 |
| Patient room access corridor ^d | 45 | 45 |
| Existing Construction | | |
| Patient room to patient room | 35 | 40 |
| Public space to patient room ^b | 40 | 40 |
| Service areas to patient room ^c | 45 | 45 |

^a Sound transmission class (STC) shall be determined by tests consistent 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.

^b Public space includes corridors (except patient room access corridors), lobbies, dining rooms, recreation rooms, treatment rooms and similar space.

^c 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.

^d Patient room access corridors contain composite walls with doors/windows and have direct access to patient rooms.

Table 2A

Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities¹

| 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 |
|--|---|--|---|---|--|
| SURGERY AND CRITICAL CARE | | | | | |
| Operating/surgical cystoscopic/minor surgical rooms ⁹ | OUT | 3 | 15 | -- | No |
| Trauma room ¹⁰ | Out | 3 | 15 | -- | No |
| Anesthesia gas storage | In | -- | 8 | Yes | -- |
| Endoscopy 18 | OUT | 2 | 6 | -- | No |
| Bronchoscopy 18 | IN | 2 | 12 | Yes | No |
| Other procedure rooms | Out | 2 | 6 | -- | -- |
| Cardiac Catheterization/Angiography ¹⁶ | OUT | 3 | 15 | -- | No |
| Delivery room ⁹ | OUT | 3 | 15 | -- | No |
| Recovery room ⁹ | -- | 2 | 6 | -- | No |
| Critical and intensive care | Out | 2 | 6 | -- | No |

Table 2A - Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities¹

| 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 |
|---|---|--|---|---|--|
| NURSING | | | | | |
| Patient room | -- | 2 | 2 | -- | -- |
| Newborn nursery | Out | 2 | 6 | -- | -- |
| Protective environment room ¹¹ | OUT | 2 | 12 | -- | No |
| Airborne Infection Isolation room ¹² | IN | 2 | 12 | Yes | No |
| Isolation alcove or anteroom ^{11, 12} | In/Out | -- | 10 | Yes | No |
| Labor/delivery/recovery | -- | 2 | 2 | -- | -- |
| Labor/delivery/recovery/postpartum | -- | 2 | 2 | -- | -- |
| DIAGNOSTIC AND TREATMENT | | | | | |
| Nuclear Medicine and X-ray (diagnostic & treatment) ¹⁷ | -- | -- | 6 | -- | -- |
| Darkroom | In | -- | 10 | Yes | No |
| Nuclear medicine hot lab | In | -- | 10 | Yes | No |

Table 2A - Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities¹

| 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 |
|--|---|--|---|---|--|
| LABORATORY | | | | | |
| General ¹³ | -- | 2 | 6 | -- | -- |
| Biochemistry ¹³ | Out | 2 | 6 | -- | No |
| Cytology | In | 2 | 10 | Yes | No |
| Glass Washing | In | 2 | 10 | Yes | -- |
| Microbiology ¹³ | In | 2 | 10 | Yes | No |
| Pathology | In | 2 | 10 | Yes | No |
| Serology | Out | 2 | 6 | -- | No |
| Sterilizing | In | 2 | 10 | Yes | -- |
| Autopsy room | IN | -- | 12 | Yes | No |
| Non-refrigerated body-holding room | In | -- | 10 | Yes | -- |
| DIAGNOSTIC AND TREATMENT | | | | | |
| Examination/Treatment/Physical Therapy ¹⁰ | -- | -- | 6 | -- | -- |
| Hydrotherapy | In | -- | 10 | Yes | No |

Table 2A - Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities¹

| 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 |
|---------------------------------------|---|--|---|---|--|
| CENTRAL SURGICAL SUPPLY | | | | | |
| ETO-sterilizer room | IN | -- | 10 | Yes | No |
| Sterilizer mechanical equipment room | In | -- | 10 | Yes | -- |
| Soiled or decontamination room | In | -- | 10 | Yes | No |
| Clean workroom | OUT | -- | 4 | -- | No |
| Sterile storage | OUT | -- | 4 | -- | -- |
| FOOD SERVICE | | | | | |
| Food preparation center ¹⁴ | -- | -- | 10 | -- | No |
| Dietary storage | -- | -- | 2 | -- | -- |
| Warewashing | In | -- | 10 | Yes | No |
| SUPPORT SPACES | | | | | |
| Medication room | Out | -- | 4 | | |
| Clean linen storage | Out | -- | 2 | -- | -- |
| Clean workroom or clean holding | Out | -- | 4 | -- | -- |
| Dialyzer reprocessing room | In | -- | 10 | Yes | No |
| Endoscopy scope reprocessing room | In | -- | 10 | Yes | No |

Table 2A - Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities¹

| 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 |
|--------------------------------------|---|--|---|---|--|
| SUPPORT SPACES (CONTINUED) | | | | | |
| Housekeeping Room | In | -- | 10 | Yes | No |
| Laundry - processing | -- | -- | 10 | -- | -- |
| Patient decontamination room | IN | 2 | 12 | Yes | No |
| Pharmacy (General) | Out | 2 | 4 | -- | -- |
| Pharmacy (Sterile compounding areas) | OUT | 2 | 4 | -- | -- |
| Soiled linen (sorting and storage) | In | -- | 10 | Yes | No |
| Soiled linen and trash chute room | In | -- | 10 | Yes | No |
| Soiled workroom or soiled holding | In | -- | 10 | Yes | No |
| Triage ¹⁹ | In | 2 | 12 | Yes | -- |
| Toilet/Bath/Shower Rooms | In | -- | 10 | Yes | No |
| Waiting room ¹⁹ | In | 2 | 12 | Yes | -- |

Table 2B**Temperature and Humidity Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities¹**

| Area designation | Relative humidity ⁷ (%) | Design temperature ⁸ (degrees F) |
|--|---------------------------------------|--|
| <u>SURGERY AND CRITICAL CARE</u> | | |
| Operating/surgical cystoscopic rooms ⁹ | 30-60 | 68-73 |
| Delivery room ⁹ | 30-60 | 68-73 |
| Recovery room ⁹ | 30-60 | 70-75 |
| Critical and intensive care | 30-60 | 70-75 |
| Treatment room ¹⁰ | 30-60 | 70-75 |
| Trauma room ¹⁰ | 30-60 | 70-75 |
| Patient room | 30-60 | 70-75 |
| Endoscopy | 30-60 | 68-73 |
| Bronchoscopy | 30-60 | 68-73 |
| Newborn nursery suite | 30-60 | 75 |
| X-ray (surgical/critical care and catheterization) | 30-60 | 70-75 |

Notes:

¹The 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 62-1999, ASHRAE "HVAC Design Manual for Hospitals and Clinics", "2005 ASHRAE Handbook – Fundamentals", and Standard 62.1-2004 – Ventilation for Acceptable Indoor Air Quality. 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.

²Rooms with air movement relationship designated in bold and all caps shall comply with section 7.31.D28. Design of the ventilation system shall provide discernible (from flutter or smoke testing) 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. The volume of infiltration or exfiltration from an individual room shall equal 15 percent of the minimum total air changes per hour, as defined by the table, or 50 cfm per door opening, whichever is larger.

³To satisfy exhaust needs, replacement air from the outside is necessary. Table 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.

⁴Number 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.

⁵Air 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.

⁶Recirculation 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, intensive care, special care nurseries, PACU, angiography, interventional radiology, and cardiac catheterization labs. See sections 7.31.D26 and 7.31.D27 for description of recirculation units to be used in isolation rooms.

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.

⁷The ranges listed are the minimum and maximum limits where control is specifically needed.

⁸Where 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 when patients may be undressed and require a warmer environment. Nothing in these design standards 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.

⁹National 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.

¹⁰The 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.

¹¹The 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 MERV 17 in the supply air stream. 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.

¹²The infectious disease isolation room described in these design standards 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 all functions are not acceptable.

¹³When required, appropriate hoods and exhaust devices for the removal of noxious gases or chemical vapors shall be provided (see Section 7.31.D14. and 15 and NFPA 99).

¹⁴Food 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.D16.

¹⁵In rooms where dishwashing occurs, higher levels of air changes may be required.

¹⁶The term cardiac catheterization/angiography as used here encompasses any invasive diagnostic or therapeutic procedure where surgical asepsis is used during incision of the skin or insertion of an instrument into a sterile cavity.

¹⁷The term x-ray (diagnostic and treatment) refers to non-invasive diagnostic procedures that do not require sterile technique as part of the procedure, but may necessitate short-term venous access.

¹⁸To accommodate a variety of procedures, ventilation in rooms used for both endoscopy and bronchoscopy shall follow the requirements for bronchoscopy rooms. Rooms used for bronchoscopy procedures shall comply with sections 7.2.C2, 7.2.C3, and 7.2.C4.

¹⁹Required in the emergency department and as specified by the ICRA in other departments such as radiology and lab, where TB screening takes place. 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.

Table 3**Filter Efficiencies for Central Ventilation and Air Conditioning Systems in General Hospitals and Outpatient Facilities**

| 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 | 8 | 14* |
| * May be reduced to MERV 13 for 100% outside air systems | | | |
| Protective Environment Room | 2 | 8 | 17 |
| Laboratories | 1 | 13 | -- |
| Administrative, bulk storage, soiled holding areas, food preparation areas, chemical dependency units, psychiatric units, outpatient dialysis units and laundries | 1 | 8 | -- |

Notes:

Additional roughing or prefilters should be considered to reduce maintenance required for filters with efficiency higher than MERV 12. The filtration efficiency ratings are based ASHRAE Standard 52.2-1999 -- Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.

Minimum Efficiency Reporting Value (MERV) ASHRAE Std.52.2 versus ASHRAE Std.52.1, Dust Spot Efficiency and IEST-RP-CC001.3:

| | | |
|------------|--------|---|
| MERV 17 | 99.97% | ASHRAE/ANSI Standard 52.1 measures efficiency based on the weight of dust captured on the filter and was created to determine the filter effectiveness to reduce soiling of surfaces. ASHRAE/ANSI Standard 52.2-1999 was developed to test for a filter's effectiveness in capturing respirable particles and protecting HVAC equipment. Minimum efficiency reporting values (MERV) are developed from tests using three particle ranges. |
| MERV 15-16 | >95% | |
| MERV 14 | 90-95% | |
| MERV 13 | 80-90% | |
| MERV 11-12 | 60-75% | |
| MERV 9-10 | 40-55% | |
| MERV 8 | 30-35% | |

HEPA filters are not tested per Standard 52.2, but have been assigned MERV values based on their performance in accordance with IEST test standards. The following approximate cross reference is based on information in ASHRAE/ANSI Standard 52.2-1999, Appendix E.

Table 4

Hot Water Design

| | Clinical | Dietary ¹ | Laundry |
|---------------------------|----------|----------------------|---------|
| Gallons per hour per bed* | 3 | 2 | 2 |
| Temperature (°F)** | 120 | 120 | 160** |

¹ Provisions shall be made to provide 180 °F rinse water at warewasher in accordance with the manufacturers recommendations and as approved by the AHJ. (May be provided by a separate booster.)

* 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 near that of the source tank and the cold water used for tempering is relatively warm.

** Provisions shall be made to provide 160 °F 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, 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 should be available when needed for special conditions.

Section 202 of the Michigan Plumbing Code defines domestic hot water as at least 110 °F.

Table 5**Station Outlets for Oxygen, Vacuum (Suction), and Medical Air Systems**

| Location | Oxygen | Vacuum | Med. Air |
|--|-------------------|---------------|-------------------|
| Inpatient bed (Medical and Surgical) 1 | 1 | 1 | -- |
| Inpatient Examination/Treatment locations ¹ (Including diagnostic and therapeutic radiology) | 1 | 1 | -- |
| Critical Care (General) | 2 | 3 | 1 |
| Critical Care Examination/Treatment | 2 | 3 | 1 |
| Coronary Critical Care | 2 | 3 | 1 |
| Newborn Intensive Care | 3 | 3 | 3 |
| Newborn Nursery (Full-Term) ² | 1 | 1 | 1 |
| Special Care Nursery | 1 | 1 | 1 |
| Pediatric and Adolescent | 1 | 1 | 1 |
| Psychiatric Patient Rooms | -- | -- | -- |
| Seclusion Treatment Room | -- | -- | -- |
| Pre-procedure inpatient holding | 1 | 1 | 1 |
| Operating Room | 2 | 3 | 1 |
| Non-Surgical Cystoscopy, Lithotripsy, Urology | 1 | 1 | 1 |
| Minor (no anesthesia) Surgical Room | 1 | 1 | 1 |
| Bronchoscopy | 2 | 2 | 1 |
| Non-surgical Endoscopy | 1 | 2 | 1 |
| Post-Anesthetic Care Unit | 1 | 3 | 1 |
| Anesthesia Workroom | 1 per workstation | -- | 1 per workstation |
| Outpatient Recovery | 1 | 1 | -- |
| Postpartum Bedroom | 1 | 1 | -- |
| Delivery Room | 2 | 3 | 1 |
| Labor Room | 1 | 1 | 1 |

Table 5 – Station Outlets for Oxygen, Vacuum (Suction), and Medical Air Systems Continued....

| Location | Oxygen | Vacuum | Med. Air |
|--|---------------|-------------------|-------------------|
| Recovery Room | 1 | 3 | -- |
| Labor/Delivery/Recovery (LDR) | 2 | 2 | 1 |
| Labor/Delivery/Recovery/Postpartum (LDRP) | 2 | 2 | 1 |
| Initial Emergency Management per bed | 1 | 1 | -- |
| Triage Area (Definitive Emergency Care) | 1 | 1 | 1 |
| Definitive Emergency Care Exam/Treatment Rooms | 1 | 1 | 1 |
| Trauma/Cardiac/Resuscitation & associated imaging Room(s) | 2 | 3 | 1 |
| Orthopedic and Cast Room | 1 | 1 | -- |
| Cardiac Catheterization/Angiography & Interventional Radiology Lab | 2 | 2 | 1 |
| Autopsy Room | -- | 1 per workstation | 1 per workstation |

¹ Some patients do not tolerate high oxygen levels and therefore need medical air in place of oxygen. Therefore, recommend that medical air be provided in these rooms and especially in isolation rooms where a higher likelihood of respiratory cases would be admitted.

² Two full term newborns may share these outlet/inlets, however NFPA requires one vacuum inlet per full term newborn.

8 NURSING FACILITIES

8.1 General Conditions

8.1.A 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 (Hospital Long Term Care) or other health care facility, and represents minimum requirements for new construction and shall not be applied to existing facilities unless major construction renovations (see Section 1.2.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 Programs, including:
- Ventilator dependent care facilities 8.7.
- Alzheimer's and other dementia units 8.8.
- Dialysis Services 8.33.

A.8.1.A Nursing homes are also governed under licensing rules promulgated via the authority of section 217 of the P.A. 368 (the Public Health Code) and federal certification requirements as stated in part 483 of the Code of Federal Regulations.

Specific requirements for each of the above special care facility types are addressed in the paragraphs noted above. For basic requirements, see Chapters 1 through 6.

8.1.B 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 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 should maximize opportunities for ambulation and self-care, socialization, independence, and minimize the negative aspects of an institutional environment.

8.1.D See Chapter 3 (Site)

8.1.E Paved roads shall be provided within the property for access to all entrances and loading docks. Paved walkways shall be provided for pedestrian traffic.

8.1.F 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 The sponsor for each project shall provide an operational narrative for the facility. (See Section 1.1.C. of this document.) Deviations to these standards shall be described and justified in the operational narrative for specific approval by the AHJ.

8.1.H Each nursing facility shall, as a minimum, contain the elements described within the applicable paragraphs of this chapter.

8.1.I See Section 1.2. (Renovation)

- 8.1.J** See Section 1.4. (Provisions for Disasters)
- 8.1.K** See Section 1.5. (Codes and Standards)
- 8.1.L** (Not Used)
- 8.1.M** See Chapter 4. (Equipment)
- 8.1.N** See Chapter 5. (Construction)
- 8.1.O** See Chapter 6. (Record Drawings and Manuals)

8.2 Resident Nursing Unit

Each resident unit shall comply with the following:

- 8.2.A** Maximum travel distance from the staff station to a resident room door shall be 120 feet. Arranging groups of resident rooms adjacent to decentralized service areas, optional satellite staff work areas, and optional decentralized resident support areas is acceptable.
 - A.8.2.A Smaller groupings of resident rooms with dedicated day/dining rooms and support rooms for decentralized staffing offer several advantages: institutional look and feel can be replaced with a more home like environment, clean and soiled linen rooms are located closer to the resident rooms, unit scale and appearance reinforces smaller groups of rooms seen as being grouped or related and personal relationships between staff and residents can form more easily. Note that the design of the nurse call system must match the staffing patterns as they may change significantly from one shift to another under this model.
- 8.2.B** 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.
 - 8.2.B2. Room size and configuration shall permit resident(s) options for bed location(s), make provision for visual privacy, and shall not be less than 120 square feet in single-bed rooms and 100 square feet per bed in multiple-bed rooms (exclusive of toilets, closets, lockers, wardrobes, alcoves or vestibules, in both cases). In renovations, minimum room areas (exclusive of toilets, closets, lockers, wardrobes, alcoves or vestibules) shall be 100 square feet in single-bed rooms and 80 square feet per bed in multiple-bed rooms. In multiple-bed rooms, clearance shall allow for the movement of beds and equipment without disturbing residents. A resident room shall have not less than a 3-foot clearance available on both sides and at the foot of each bed.
 - A.8.2.B2 Room size (area and dimensions) should 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 her 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.
 - 8.2.B3 Each room shall have a window that meets the requirements of Section 7.28.A10.
 - 8.2.B4 Handwashing facilities consistent with Section 2.1.A. shall be provided in each resident room and connecting toilet room. The handwashing facility may be omitted from the connecting toilet room when that toilet room serves a private resident room or is shared between two private resident rooms.

- A.8.2.B4 Accessibility to handwashing facilities is essential for residents and staff to carry out standard precautions at all times. Additional use of hand sanitizers is encouraged but a handwashing facility should be available to the staff even when the toilet room is occupied. The exception still provides a handwashing station for the resident using the toilet room but room design should consider sink placement in terms of a) proximity to the toilet room and b) type/design of sink to enhance a home-like environment.
- 8.2.B5 Each resident room 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 resident rooms. The toilet room shall contain a water closet and a handwashing facility and the door shall swing outward or be double acting.
- 8.2.B6 Each resident room shall provide a minimum of 5 square feet of floor space per bed for wardrobe and closet, in addition to other requirements for usable floor space per bed.
- 8.2.B7 In multiple-bedrooms, visual privacy from casual observation by other residents and visitors shall be provided for each resident. The design for privacy shall not restrict resident access to the entrance, lavatory, toilet room, or wardrobe.
- 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 At least 50% of all resident beds shall be located in sleeping rooms and connecting toilet rooms that comply with the accessibility requirements from the Michigan Building Code.
- 8.2.B10 The need for and number of required airborne infection isolation room(s) in nursing facilities 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.
- A.8.2.B10 The number of airborne infection rooms shall be provided as determined by the Infection Control Risk Assessment. These rooms shall comply with section 7.2.C.
- 8.2.B11 Each nursing facility shall have at least one single-bed resident room with attached lavatory, water closet, and bathing facility reserved for the use of the occupant of the room only.
- 8.2.C** The services listed below shall be provided in each nursing unit. These services shall be in or readily available to each resident module.
- A.8.2.C 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 resident module but, unless noted otherwise, at least one such service area should 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.
- 8.2.C1 Staff work area(s). Resident units shall have staff work areas in central or decentralized direct care locations. Where care giving is organized on a central staffing model, such work areas shall have space for charting, storage, and administrative activities. Where care giving is decentralized, supervisory work areas need not accommodate charting activities, nor have direct visualization of resident rooms; such functions shall be accomplished at the decentralized direct care staff work areas, which shall have space for charting and any storage or administrative functions required by the operational narrative.
- A.8.2.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, care-giving 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. Service areas shall be provided consistent with the requirements of Section 2.7.B, 2.7.C, 2.7.F, 2.7.G, 2.7.H, 2.7.I, 2.7.J, 2.7.L, and 2.7.O.
- A.8.2.C2 Note that nursing home licensing rule 902(2) requires that bulk controlled substances be kept in a locked box within a locked medication cabinet.
- 8.2.C3 (Not Used)
- 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 (Not Used)
- 8.2.C6 (Not Used)
- 8.2.C7 (Not Used)
- 8.2.C8 (Not Used)
- 8.2.C9 (Not Used)
- A.8.2.C9 Ice-makers should be located, designed and installed to minimize noise, and may serve more than one nourishment station).
- 8.2.C10 (Not Used)
- 8.2.C11 Resident bathing facilities: A minimum of one bathtub or shower shall be provided for every 20 residents (or fraction thereof) not otherwise served by bathing facilities in resident rooms.

Residents shall have access to at least one central bathing 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.

Showers or tubs shall be in individual rooms or enclosures with space for private use of the bathing fixtures, for drying and dressing and access to a grooming location containing a sink, mirror and counter or shelf.

A water closet and handwashing facility consistent with Section 2.1.A., shall be provided within or directly accessible to each resident's bathing facility without requiring entry into the general corridor.

Provide for storage of soap, towels, and other supplies within these facilities.

8.3 Resident Support Areas

8.3.A A minimum of 30 square feet of floor space per resident bed shall be provided for dayroom, dining, recreation, and activity purposes with a minimum total area of at least 225 square feet. At least 20 square feet per resident bed of this space shall be available for dining. Handwashing facilities are required in all dining rooms as per section 2.1.A.

A.8.3.A The space needed for dining and recreation should be determined by considering: needs of residents to use adaptive equipment and mobility aids and receive assistance from support and service staff; and the extent to which support programs should be centralized or decentralized, as required by the operational narrative. It is important to provide outdoor views from dining, recreation, and living spaces. Nothing in these 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 A minimum of 10 square feet per bed of general storage space(s) for supplies, resident needs, and recreation shall be provided. Up to 50% of this storage capacity can be provided in other buildings on site that are of weatherproof and vermin resistant construction.

8.4 Activities (Not Used)

A.8.4 If required by the operational narrative, include space for files, records, computers, 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. Hearing loss in the elderly is well documented. Quiet space is very important to enable conversation. Nothing in these 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 that provides physical and/or occupational therapy services for rehabilitating long-term care residents shall have areas and equipment consistent with the operational narrative. 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 (Not Used)

8.5.A3 Storage for supplies and equipment

8.5.A4 Handwashing facilities consistent with Section 2.1.A. within the therapy unit.

8.5.A5 (Not Used)

8.5.A6 Provisions for resident privacy

8.5.A7 Housekeeping rooms, consistent with Section 2.7.Q.

8.5.A8 A barrier-free resident toilet room convenient to the unit

8.5.B Physical and Occupational Therapy for Outpatients

If the program includes outpatient treatment, additional provisions shall include:

- a. Convenient facility access usable by the disabled
- b. Lockers for storing patients clothing and personal effects
- c. Outpatient facilities for dressing

8.6 Personal Services (Barber/Beauty) Areas

Facilities and equipment for resident hair care and grooming shall be provided separate from the resident rooms.

A.8.6 Consideration should be given to the special ventilation and exhaust requirements of these areas.

8.7 Chronic Ventilator Dependent Care Unit

In addition to the requirements of sections 8.2 and 8.3 the following shall be provided:

- a. Emergency-powered overbed lights at each resident bed
- b. A minimum of two emergency powered electrical duplex receptacles shall be provided at each resident bed.
- c. Piped oxygen and vacuum outlets shall be provided at each bed. Portable oxygen cylinders and portable suction will be acceptable if justified by the operational narrative.
- d. Ventilator alarms shall initiate a visual and audible signal in the corridor directly outside of the resident bedroom.
- e. Provisions shall be made for audible alarms to the nurse stations and other staffed locations for the ventilators.

A.8.7 These standards are meant to be enforced only upon Ventilator Dependent Care Units, which is a specific designation for units approved for additional Medicaid reimbursement, not to individual circumstances. These units shall also comply with life support provisions in NFPA 70. The facility must also address the need for uninterrupted power, battery backup, additional staff for hand pumping in case of loss of electrical power. In no case will rooms be approved for this use that don't meet these standards for room size or layout.

8.8 Alzheimer's and Other Dementia Units

A.8.8 The latest edition of the Life Safety Code recognizes the need to lock doors in Alzheimer's units. Consideration should be given to providing locks on wardrobes, closets, or cupboards inconspicuous.

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.

Under the Certificate of Need special pool beds program, Alzheimer's and other age associated cognitive decline units may also be required to have an enclosed interior or exterior activity space for resident use.

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, wayfinding cues and information, to aid in navigation from point to point. Sensory cueing 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.

8.9 Dietary Facilities

Shall be consistent with the requirements of Section 7.18.

8.10 Administrative and Public Areas

8.10.A (Not Used)

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 provisions for private interviews.

A8.10.C Nursing home licensing rules 1308(3) and 1308(4) requires that offices be provided for the administrator and director of nursing.

8.10.D Multipurpose Room(s)

There shall be a multipurpose room for conferences, meetings, staff development, and health education purposes as required by the operational narrative; it shall include provisions for the use of visual aids. One multipurpose room may be shared by several services.

8.10.E Clerical files, staff work area, and storage area for office equipment and supplies shall be provided.

8.10.F See Section 7.25 (Staff facilities)

8.11 Linen Services

Provide consistent with the requirements of Section 7.23.

8.12 Housekeeping Rooms

Provide consistent with the requirements of Section 2.7.Q. There shall be at least one housekeeping room for each floor.

8.13 Engineering Service and Equipment Areas

Provide consistent with the requirements of Section 7.27.

8.14 Details

A.8.14 Resident facilities require features that encourage ambulation of long-term residents, including safe outside space. Signage and wayfinding features should be provided to aid self-ambulating residents and avoid confusing or disorienting them. Potential hazards to residents, such as sharp corners, slippery surfaces, and thick carpeting should 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 See Section 7.28.A3. (Corridor obstructions)

8.14.A2 See Sections 7.28.A6 and 7.28.A8. (Door requirements)

8.14.A3 See Section 7.28.A9. (Insect screens for some doors and operable windows)

8.14.A4 Resident rooms or suites and day/dining/activity rooms shall have windows consistent with the requirements of Section 7.28.A10. Windows in resident rooms shall be located so as to provide a direct exterior view from the head of all resident beds.

8.14.A5 Rooms which contain bathtubs, sitz baths, showers, and/or water closets for patient use shall be equipped with doors and hardware permitting privacy and 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.

8.14.A6 See Section 7.28.A13. (Thresholds)

8.14.A7 See Section 7.28.A14. (Grab bars)

8.14.A8 Handrails with end returns shall be provided on both sides of all corridors normally used by residents. A minimum clearance of 1-1/2 inches (3.81 cm) shall be provided between the handrail and the wall. Handrails shall be finished to minimize potential for personal injury. Cross-sectional characteristics of handrails shall comply with sections 505.5, 505.6, 505.7, 505.8, and 505.9 of ICC/ANSI 117.1-1998.

- A.8.14.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 while ambulating.
- 8.14.A9 (Not Used)
- 8.14.A10 Lavatories, handwashing facilities and handrails, which a resident could use for support, shall be securely anchored.
- 8.14.A11 Each resident handwashing facility shall have a mirror. Mirror placement shall allow for convenient use by both wheelchair occupants and/or ambulatory persons.
- 8.14.A12 Building elements, including radiant heating units, shall be designed so that the exposed surface temperature within 7 feet of the floor in resident care areas does not exceed 125 degrees Fahrenheit.
- 8.14.A13 See Section 7.28.A20. (Minimum ceiling heights)
- A.8.14.A13 Note that Michigan licensing rule 1316(18)(a) requires minimum 8 foot ceiling heights in resident sleeping, day, dining, recreation, or activity rooms.
- 8.14.A14 See Section 7.28.A22. (Rooms containing heat producing equipment)
- 8.14.A15 See Section 7.28.A25. (Soffit/sloped tops)

8.15 Finishes

- 8.15.A** See Section 7.28.B4. (Floor coverings)
- 8.15.B** See Section 7.28.B6. (Wall finishes)
- 8.15.C** See Section 7.28.B7. (Sealing of penetrations)
- 8.15.D** 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 all resident bedrooms and care areas where dust fallout might create a problem.

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8.30 Special Systems

- 8.30.A** General (Not Used)
- 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).
- Engineered traffic studies are recommended. In the absence of an engineered traffic study, the number of elevators shall comply with the following:
- a. At least one elevator shall be installed that has inside dimensions that accommodate a resident bed with attendants, where residents are housed on any floor other than the main entrance floor. The clear inside dimension of such cars shall be at least 5 feet wide by 7 feet 6 inches deep. Car doors shall have a clear opening of not less than 3 feet 8 inches.

- b. When 60 to 200 residents are housed on floors other than the main entrance floor, at least two elevators shall be installed.
- c. When 201 to 350 residents are housed on floors other than main entrance floor, at least three elevators shall be installed.
- 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.
- e. When the nursing facility is part of a general hospital, elevators may be shared, and the standards of Section 7.30.B shall apply.
- f. In renovations, existing elevators that can accommodate resident beds used in the facility will not be required to be increased in size.

8.30.B2 All elevators required for passenger service shall be constructed to accommodate wheelchairs.

Handrail projections of up to 3.5 inches should not be construed as diminishing the clear inside dimensions.

8.30.C See Section 7.30.C (Waste Processing Service)

8.31 Mechanical Standards

A.8.31 The mechanical system should 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 should 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.

Facility design considerations should include site, building, location, climate, orientation, configuration, and thermal requirements. As appropriate, controls for air-handling systems should be designed with an economizer cycle to use outside air for cooling and/or heating.

8.31.A General requirements

8.31.A1 The HVAC systems shall be designed as fully ducted to achieve and meet occupancy comfort conditions in accordance with Tables 6A and 6B, and filtration efficiencies in accordance with Table 7 and consistent with 7.31.A4.

8.31.A2 (Not Used)

8.31.A3 (Not Used)

8.31.A4 (Not Used)

8.31.A5 (Not Used)

8.31.A6 See Section 7.31.A7 (Vibration isolators)

8.31.B Thermal and acoustical insulation consistent with the requirements of Section 7.31.B shall be provided.

- 8.31.C** The heating system shall be designed to maintain 72 F. (measured 3 feet above the floor) in all resident bedrooms, corridors, day/dining rooms and other resident care areas under normal power and for a minimum of 24 hours in the event of loss of electrical service to the facility.
- Domestic hot water systems consistent with the requirements of Section 7.31.C shall be provided, except for the backup provision under breakdown or routine maintenance is not required.
- 8.31.D** Air Conditioning, Heating, and Ventilation Systems
- 8.31.D1 The ventilation system for the space shall be adequate to maintain the space condition based on space load requirements, but be no less than the requirements of Tables 6A and 6B. Table 7 filtration efficiencies shall also be used.
- Airflow shall be controlled and maintained to ensure movement of air from clean to less clean areas. All rooms used for resident care shall be temperature controlled and shall comply with the standards set in Table 6B. When humidification is provided, steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.
- A.8.31.D1 The ventilation rates shown in Tables 6A and 6B, as applicable, should be used only as minimum standards; they do not preclude the use of higher rates as appropriate. It is recommended that the entire facility be served from central mechanical ventilation systems, though natural ventilation or individual units may be used.
- ASHRAE Standard 55 recommends 30 to 60 percent relative humidity for comfort however achieving relative humidity as high as 30 percent may not be practical without the use of central ventilation systems. Condensation on filters and ductwork must be avoided. Steam humidifiers should 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 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 See 7.31.D2. (Exhaust requirements and return plenum prohibition)
- 8.31.D3 See 7.31.D3. (Intake air locations)
- 8.31.D4 (Not Used)
- 8.31.D5 Filter efficiencies shall be tested consistent with ASHRAE 52.2-99. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing ductwork. All joints between filter segments and the enclosing duct work shall have gaskets or seals to provide a positive seal against air leakage. A manometer or other means to monitor pressure differential shall be installed across each filter bed having a required efficiency of MERV 13 or more. Location of filters shall comply with sections 7.31.D8 and 7.31.D9.
- 8.31.D6 See Section 7.31.D10. (Duct cleaning accessibility)
- 8.31.D7 Provide emergency cooling capacity compliant with Table 6B for a portion of the building sufficient to house all residents. This portion of the building shall accommodate the various needs of the resident population and allow for safe exiting as per The Federal Certification Requirements under the Conditions of Participation for Medicare 42 CFR 483.15 (h) (6).
- 8.31.D8 Individual room units that are used for heating and cooling purposes (fan-coil units, heat pump units, etc.) shall be equipped with manufacturer's recommended filters. These units shall be used as recirculating units only and serve a single room only. All outdoor air requirements shall be met

by a separate central air handling system directly ducted into each room with the proper filtration, as noted in Table 7.

8.31.D9 See 7.31.D20. (Combustion air and room 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 authority having jurisdiction.

8.31.E1 (Not Used)

8.31.E2 The following standards shall apply to potable water supply systems:

- a. (Not Used)
- 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. The potable water supply shall be designed, installed and maintained to prevent contamination from non-potable liquids, solids or gases being introduced into the potable water supply through cross-connections.
- d. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.

8.31.E3 See Section 7.31.E3. (Hot water systems)

8.31.E4 The following standards shall apply to drainage systems:

- a. (Not Used)
- 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. (See Section 3.1.D).
- 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 See Section 7.31.E7. (Piping identification)

8.32 Electrical Standards

8.32.A General

8.32.A1 See Section 7.32.A1. (Comply with various AHJ's)

8.32.A2 (Not Used)

8.32.A3 (Not Used)

8.32.A4 Lighting

- a. Lighting shall meet or exceed the minimum illumination levels listed in Table 8 unless specified below.
- b. Sufficient light for an exterior ramp, step, and porch shall be provided for safety of persons using the facilities.

- c. Resident rooms and connecting toilet 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 the resident(s). Incandescent and halogen light sources which produce heat shall be avoided to prevent burns to the resident and/or bed linen. Flexible light arms, if used, shall be mechanically controlled to prevent the lamp from contacting the bed linen.
- d. Resident unit corridors shall have general illumination with provisions for reducing light levels at night.
- e. Light fixtures shall be equipped with lenses or shields for protection of the lamps or with lamps that will not shatter.

A.8.32.A4 The reader should refer ANSI/IESNA RP-29-06, "Recommended Practice for Lighting for Hospitals and Health Care Facilities" for additional information. Excessive differences in illumination levels within the same range of sight should be avoided as aging eyes adapt to these differences more slowly. Lighting should be designed to minimize 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, door hardware/trim, faucets from sinks, or control knobs from appliances). Light sources that may burn residents or ignite bed linen by direct contact should be covered or protected.

8.32.A5 Receptacles (Convenience Outlets)

- 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 each 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 apart in all corridors and within 25 feet of corridor ends.
- c. 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 shall be used throughout the facility.
- d. Ground-fault-interrupters shall comply with section 7.32.E5.

A.8.32.A5 Additional receptacles are recommended in resident rooms to help support the desired home-like atmosphere beyond resident medical needs while addressing the NFPA prohibition of relocatable power taps (power strips).

8.32.B (Not Used)

8.32.C (Not Used)

8.32.D (Not Used)

8.32.E (Not Used)

8.32.F (Not Used)

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 sends a call signal to the calling station and shall either:

- a. 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. Activate a pager worn by a staff member, identifying the specific resident and/or /OR room from which the call has been placed.

An emergency call station shall be provided at each resident toilet, bath, sitz bath, and shower room. This station shall be accessible to a resident lying on the floor. Inclusion of a pull cord or portable radio frequency push-button 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, with 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, as well as other areas defined by the operational narrative.

The system shall be on emergency power. The system may not suffer any degradation during the transfer from normal to emergency power and upon re-transfer. The system shall be intuitively easy to operate.

A.8.32.G Alternate technologies can be considered for emergency or nurse call systems subject to the approval by the AHJ.

8.32.H Emergency Electrical Service

8.32.H1 The emergency electrical service shall be capable of providing not less than 24 hours of service at full load. It shall serve lights at nursing stations, telephone switchboards, night lights, exit and corridor lights, heating plant controls, and other critical mechanical equipment essential to the safety and welfare of residents, personnel, and visitors in the home.

The emergency electrical service shall also comply with NFPA 99, NFPA 101, and the Federal Certification Requirements under the Conditions of Participation for Medicare 42 CFR 483.15 (h) (6) that requires that emergency cooling capacity be provided for a portion of the building. This portion of the building shall accommodate the various needs of the entire resident population, allow for safe exiting, and comply with Table 6A.

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 7.32.H.

8.32.H3 (Not Used)

8.32.H4 (Not Used)

8.32.H5 (Not Used)

A.8.32.H5 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 (Not Used)

8.32.J Telecommunication and Information Systems

832.J1 Cable and routing shall meet applicable fire code.

8.32.J2 A secured room shall be provided for central equipment locations.

8.33. Dialysis Services

When included in the operational narrative, provisions for on-site dialysis services shall be made, consistent with Section 7.14.

Table 6A**Ventilation of Certain Areas of Nursing Facilities¹**

| Function Area | 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 |
|--|---|--|---|---|--|
| Resident room | -- | 2 | 2 | -- | -- |
| Resident unit corridor | -- | -- | 2 | -- | -- |
| Toilet, Bath, Shower, and Hydrotherapy Rooms | In | -- | 10 | Yes | -- |
| Airborne infectious isolation rooms, if provided | In | 2 | 12 | Yes | No |
| Isolation alcoves or anterooms, if provided ⁹ | In/Out | -- | 10 | Yes | No |
| Dining rooms | -- | 2 | 2 | -- | -- |
| Activity rooms, if provided | -- | 2 | 2 | -- | -- |
| Beauty Shop | In | 2 | 12 | Yes | No |
| Physical therapy | -- | -- | 6 | -- | -- |
| Occupational therapy | -- | -- | 6 | -- | -- |
| Soiled workroom or soiled holding | In | 2 | 10 | Yes | No |
| Clean workroom or clean holding | Out | -- | 4 | -- | -- |
| Medication room | Out | -- | 4 | -- | -- |
| Examination and Treatment Rooms | -- | -- | 6 | -- | -- |
| Linen and trash chute room if provided | In | -- | 10 | Yes | No |

Table 6A - Ventilation of Certain Areas of Nursing Facilities¹ (Continued)

| Function Area | 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 |
|---|---|--|---|---|--|
| Laundry processing | -- | 2 | 10 | Yes | No |
| Soiled linen sorting and storage | In | -- | 10 | Yes | No |
| Clean linen storage | Out | -- | 2 | -- | No |
| Food preparation facilities ¹⁰ | -- | -- | 10 | -- | No |
| Dietary warewashing | In | -- | 10 | Yes | No |
| Dietary storage areas | -- | -- | 2 | -- | -- |
| Housekeeping rooms | In | -- | 10 | Yes | No |

Table 6B**Temperature and Humidity of Certain Areas of Nursing Facilities¹**

| Function Area | Relative humidity ⁷ (%) | Design Temperature ⁸ (degrees F) |
|--|---------------------------------------|--|
| Resident room ¹¹ | -- | 71-81 |
| Resident unit corridor | -- | -- |
| Toilet Room | -- | 75 |
| Airborne infectious isolation rooms, if provided | -- | 71-81 |
| Isolation alcoves or anterooms, if provided ⁹ | -- | -- |
| Dining rooms ¹¹ | -- | 75 |
| Activity rooms, if provided ¹¹ | -- | 75 |
| Physical therapy | -- | 75 |
| Occupational therapy | -- | 75 |
| Soiled workroom or soiled holding | -- | -- |
| Clean workroom or clean holding | -- | 75 |
| Medication room | -- | -- |
| Sterilizer exhaust room | -- | -- |
| Linen and trash chute room if provided | -- | -- |
| Laundry, general, if provided | -- | 80 |
| Soiled linen sorting and storage | -- | -- |
| Clean linen storage | -- | -- |
| Food preparation facilities ¹⁰ | -- | 80 |
| Dietary warewashing | -- | -- |
| Dietary storage areas | -- | -- |
| Housekeeping rooms | -- | -- |
| Bathing rooms | -- | 75 |

Notes:

¹The 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 of Applications. OSHA standards and/or NIOSH criteria require special ventilation requirements for employee health and safety within nursing facilities.

²Design 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. Except where specifically permitted by exit corridor plenum provisions of NFPA 90A, the volume of infiltration and exfiltration from an individual room shall equal 15 percent of the minimum total air changes per hour as defined by the table, or 50 cfm per door opening, whichever is larger.

³To satisfy exhaust needs, replacement air from outside is necessary. Table 6 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.

⁴Number 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.

⁵Air 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.

⁶Because 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.

*⁷The ranges listed are the minimum and maximum limits where control is specifically needed. See A8.31.D1 for additional information.

⁸Where 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 design standards 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.

*⁹The infectious disease isolation room described in these design standards 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 isolation and airborne infection isolation functions are not acceptable.

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.

*¹⁰Food 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.

¹¹Nursing Home Licensing Rule 325.2130 (2) states that a room used for patients shall be maintained at a regular daytime temperature of not less than 72 degrees F. measured 3 feet above the floor. The Federal Certification Requirements under the Conditions of Participation for Medicare 42 CFR 483.15 (h) (6) requires the facility to maintain comfortable and safe temperature levels. This requirement further states that facilities initially certified after October 1, 1990, must maintain a temperature level of 71-81 degrees F. The interpretive guidelines issued at the time by the Federal Health Care Financing Administration (now CMS) for this requirement indicate that "...Temperatures may, on rare, brief occasions exceed the upper range of 81 degrees F. if these facilities are located in areas of the country (primarily in the northernmost latitudes), where the temperature is exceeded only during rare, brief episodes of unseasonably hot weather"

*See section 8.31.D1 for additional information

Table 7

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 | 8 | 13* |
| <i>* May be reduced to MERV 8 for 100% outside air systems</i> | | | |
| Administrative, bulk storage, soiled holding, laundries, food preparation areas | 1 | 8 | -- |

Note: The filtration efficiency ratings are based on MERV per ASHRAE 52.2-99 Standard 52.2-1999 – Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.

Minimum Efficiency Reporting Value (MERV) ASHRAE Std.52.2 versus ASHRAE Std.52.1, Dust Spot Efficiency:

| | |
|------------|--------|
| MERV 13 | 80-90% |
| MERV 11-12 | 60-75% |
| MERV 9-10 | 40-55% |
| MERV 8 | 30-35% |
| MERV 7 | 25-30% |
| MERV 6 | <20% |

ASHRAE/ANSI Standard 52.1 measures efficiency based on the weight of dust captured on the filter and was created to determine a filter's effectiveness to reduce soiling of surfaces. ASHRAE/ANSI Standard 52.2-1999 was developed to test for a filter's effectiveness in capturing respirable particles and protecting HVAC equipment. Minimum efficiency reporting values (MERV) are developed from tests using three particle ranges.

9 FREESTANDING SURGICAL OUTPATIENT FACILITIES

9.1 General

9.1.A Section Applicability

This section applies to Freestanding Surgical Outpatient Facility (FSOF) within a non-medical facility, or part of a Health Maintenance Organization (HMO) or other health service. This section does not apply to outpatient surgical facilities within a hospital or the offices of private-practice physicians in commercial office space and are not intended to be applied to such offices in ancillary outpatient facilities.

A.9.1.A Freestanding Surgical Outpatient Facilities are also governed under licensing rules promulgated via the authority of section 20171 of the P.A. 368 (the Public Health Code) and federal certification requirements for Ambulatory Surgical Centers under Title 42, Chapter IV, subchapter B, Part 416 of the Code of Federal Regulations.

9.1.B There shall be for each project an operational narrative for the facility consistent with Section 1.1.C.

9.1.C The FSOF shall meet all the standards described herein. Deviations shall be described and justified in the operational narrative for specific approval by the AHJ.

A.9.1.C Refer to federal Ambulatory Surgical Center certification and State of Michigan FSOF licensing rules (Part 208 and Sections 325.6001 and following of Public Act 368, aka the Public Health Code) for other requirements.

9.1.D. A facility shall be located no more than 30 minutes normal travel time from the Hospital with which written emergency admission arrangements are made.

9.1.E. In the absence of a formal parking study, 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.

9.1.F. See Section 1.6 (HIPAA).

9.2 Non-Clinical Support Facilities

9.2.A Provide an entrance to the facility that complies with accessibility requirements and includes wheelchair storage out of the path of normal traffic.

9.2.B Provide a reception counter or desk, waiting space(s), accessible public toilet rooms, public telephone(s), and drinking fountain(s).

9.2.C Provide general or individual office(s) for business transactions, records, administrative, and professional staffs. These shall be separate from public and patient areas with provisions for confidentiality of records. Enclosed office spaces for administration and consultation shall be provided.

9.2.D Locker rooms shall be provided for male and female personnel (orderlies, technicians, nurses, and doctors) working within the FSOF. The areas shall contain lockers, showers, water closets, handwashing facilities, and space for donning surgical attire.

9.2.E Facilities shall be provided where patients may change from street clothing into gowns for surgery that provide visual privacy and security of their belongings. This would include a waiting room, locker(s), water closet(s), and clothing change or gowning area. Changing may also be accommodated in a private holding room or cubicle.

9.2.F Sufficient housekeeping rooms consistent with the requirements of Section 2.7.Q shall be provided throughout the facility, as required to maintain a clean and sanitary environment. There shall not be less than one housekeeping room for each floor.

9.2.G A general storage room shall be provided to meet the needs of the facility.

9.2.H Facilities for engineering services and equipment areas shall be provided consistent with the operational narrative and section 7.27.

9.3. Clinical Facilities

9.3.A General operating room(s). In new construction, each room shall have a minimum clear floor area of 400 square feet with a minimum clear dimension of 20 feet exclusive of fixed or wall-mounted cabinets and built-in shelves, and a system for emergency communication with the surgical suite control station. A x-ray film illuminator or PACS shall also be provided.

A.9.3.A Where renovation work is undertaken, every effort shall be made to meet the minimum standards. If it is not possible to meet the square-foot standards, grant approval to deviate from this requirement may be granted. In such cases, each room shall have a minimum clear area of 360 square feet, exclusive of fixed or wall-mounted cabinets and built-in shelves, with a minimum of 18 feet clear dimension exclusive of fixed cabinets and built-in shelves.

9.3.B Where justified by the operational narrative, for use in eye, endoscopy, or other minor procedures that only require local anesthesia, the operating room shall have a minimum clear floor area of 250 square feet, that allows for a minimum 5 foot clearance on all sides of the patient table or stretcher from of fixed or wall-mounted cabinets and built-in shelves. A system for staff emergency communication shall be provided consistent with the requirements of Section 7.32.G4.

In addition to the above, endoscopy rooms shall include clean supply storage, work counter, and handwashing facilities as per section 2.1.A. A system for staff emergency communication shall be provided consistent with the requirements of Section 7.32.G4 and Table 10.

Provide a dedicated reprocessing room(s), accessible to a corridor, shall be provided for cleaning and disinfecting of endoscopy scopes. At a minimum each reprocessing room shall be arranged to provide a soiled to clean work flow and include: a large sink for immersion/cleaning of scopes; handwashing fixture consistent with Section 2.1.A; work counters for drop off, soaking tubs, automatic endoscope cleaners as described in the operational narrative, visual inspection, and charting; compressed air outlet at the large sink; and vacuum inlet for scope drying.

Endoscopy scope storage cabinets shall be provided outside the procedure and reprocessing rooms in an area restricted to staff only or a clean supply room.

A.9.3.B Refer to sections 7.28.B8, 7.31.D24, and 7.31.D28.

9.3.C Preoperative and recovery patient holding area(s) shall be provided that comply with the requirements of 2.3 and the operational narrative. If general anesthetics are to be used a PACU shall be provided as per the operational narrative and section 2.8.A. Provisions to comply with sections 2.7.F and 2.7.G shall be made within or immediately adjoining the PACU.

A.9.3.C Note that State licensing rule 68(1) requires sufficient recovery stations to allow for a 3 hour recovery.

9.3.D Service areas shall be provided consistent with the requirements of Sections 2.7.A, 2.7.B, 2.7.C, 2.7.D, 2.7.E, 2.7.F, 2.7.G, 2.7.H, 2.7.I, 2.7.J, 2.7.K, 2.7.L, 2.7.M, 2.7.P, 2.7.Q, 2.7.T, and 2.7.U.

9.3.E Facilities shall be provided for reprocessing of medical and surgical equipment, instruments, and supplies compliant with sections 7.7.C3 and 7.21.

- A.9.3.E Facilities for emergent reprocessing of surgical patient care items for immediate use may be located in central services if convenient.
- 9.3.F** Two scrub positions shall be provided near the entrance to each operating room. Two scrub positions may serve two operating rooms if both are located adjacent to the entrance of each operating room. Scrub facilities shall be arranged to minimize incidental splatter on nearby personnel, medical equipment, or supply carts. The scrub sinks shall be out of the main traffic areas.
- 9.3.G** Medical gas storage facilities. Main storage of medical gases shall be consistent with NFPA 99. Provision shall be made for additional separate storage of reserve gas cylinders necessary to complete at least one day's procedures.
- 9.3.H** Facilities for anesthesia equipment cleaning and testing as well as supply storage shall be provided consistent with 7.7.C9 and the operational narrative.
- 9.3.I** 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 or 50 square feet per operating room, whichever is greater.
- 9.3.J** Facilities for any clinical support services such as radiology, laboratory, or pharmacy shall comply with the appropriate sections of chapter 7 and the operational narrative.
- 9.4** **Details**
- Details shall be consistent with the requirements of sections 7.28.A and 2.1.A.
- 9.4.A** Minimum public corridor width shall be 5 feet. Corridors used for patients entry and egress shall have a minimum width of 6 feet. Corridors where patient are transported on stretchers or beds shall have a minimum width of 8 feet.
- 9.4.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 therein.
- 9.5** **Finishes**
- 9.5.A** Floor materials shall be easily cleanable and appropriately wear-resistant for the location. 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 non-slip surface. The floors subject to frequent wet cleaning shall also be homogeneous, but may have tightly sealed joints.
- 9.5.B** Floors and perimeter bases of all operating rooms shall be monolithic and joint free.
- 9.5.C** Wall finishes shall be washable. In the vicinity of plumbing fixtures, wall finishes shall be smooth and water-resistant. 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 and sterile processing rooms, wall finishes shall be smooth and free of fissures, open joints, or crevices that may retain or permit passage of dirt particles.
- 9.5.D** 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.
- 9.5.E** See section 7.28.B8 (ceilings)

9.6. Elevators

9.6.A. All outpatient facilities having critical services (such as operating, diagnostic, or therapeutic) located on other than the grade-level entrance floor shall have electric or hydraulic elevators.

9.6.B If required, at least one elevator car shall have inside dimensions that accommodate a patient stretcher with attendants and be at least 5 feet 8 inches wide by 9 feet deep. Car doors shall have a clear opening of not less than 4 feet wide and 7 feet high.

A.9.6.B Additional elevators installed for visitors and material handling are permitted to be smaller than noted above, within restrictions set by standards for disabled access.

9.7. Waste Processing Services

Provisions for waste disposal shall be consistent with the requirements of Section 7.30.C.

9.8. Mechanical Standards

9.8.A Mechanical systems shall be consistent with the requirements of Sections 7.31.A. and 7.31.B.

9.8.B. 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. Supply and return mains and risers shall be equipped with valves at each branch from the main. Each piece of equipment shall have valves at the supply and return ends.

9.8.C Heating, ventilation, and air conditioning systems shall be installed consistent with the requirements of Section 7.31.D.

9.8.D Plumbing and other piping systems shall be installed consistent with the requirements of Section 7.31.E.

9.9. Electrical Standards

9.9.A All electrical systems shall be installed consistent with the requirements of Section 7.32.A.

9.9.B Services, switchboards, panelboards, and transformers shall be installed consistent with the requirements of Section 7.32.B.

9.9.C. Lighting shall comply with section 7.32.D.

9.9.D Duplex grounded-type receptacles (convenience outlets) shall be installed consistent with the requirements of Section 7.32.E.

9.9.E A nurse call system shall be installed compliant with Section 7.32.G.

9.9.F Emergency lighting and power shall be provided consistent with NFPA 99, NFPA 101, and NFPA 110. If operated from on-site fuel source it shall be sized to provide sufficient fuel to allow for a minimum 4 hour run time at full load.

9.9.G. Telecommunications and information systems shall be installed consistent with the requirements of Section 7.32.J.

10 REHABILITATION FACILITIES

10.1 General Considerations

There shall be for each project an operational narrative for the facility consistent with Section 1.1.C. The design and construction of the project shall be consistent with the operational narrative.

The facility shall meet all the standards described herein. Deviations shall be described and justified in the operational narrative for specific approval by the AHJ.

Parking facilities shall be consistent with the requirements of Section 7.1.D.

A.10.1 Hospitals are also governed under licensing rules promulgated via the authority of section 20171 of the P.A. 368 (the Public Health Code) and federal certification requirements under Title 42, Chapter IV, subchapter E, Part 482 of the Code of Federal Regulations.

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 chord 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 shall include:

10.1.A1 Required units. Each rehabilitation facility shall contain a medical evaluation unit and one or more of the following units:

- Psychological services
- Social services
- Vocational services

10.1.A2 (Not Used)

10.2 Evaluation Unit

10.2.A (Not Used)

10.2.B Examination rooms shall be consistent with the requirements of Section 2.7.E., except that a minimum floor area of 140 square feet shall be provided.

10.2.C Evaluation room 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 workspace for patients, and storage for supplies. Where the facility is small and workload light, evaluation may be done in the examination room(s).

10.2.D Facilities shall be provided within the rehabilitation department or through contract arrangement with a nearby hospital or laboratory for services described in the operational narrative and consistent with the requirements of Section 7.12.

10.2.E Facilities shall be provided within the rehabilitation department for imaging services described in the operational narrative and consistent with the requirements of Section 7.10.

10.3 Psychological Services Unit

This shall include office(s) and workspace for testing, evaluation, and counseling.

10.4 Social Services Unit

This shall include office space(s) for private interviewing and counseling.

10.5 Vocational Services Unit

Office(s) and workspace 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 A total of 55 square feet per bed. At least 30 s.f. per resident bed of this space shall be available for dining. Windows shall be provided consistent with section 7.28.A10 for the required dining space. Provide handwashing facilities that comply with 2.1.A in each dining room.

10.6.B If dining is part of the day care program, a total of 55 square feet per person shall be provided. If dining is not part of the program, at least 35 square feet per person shall be provided for recreation and day spaces.

10.6.C General storage requirements for the facility shall be consistent with the requirements of Section 7.22. Additional storage spaces shall be provided for recreational equipment and supplies.

10.7 Dietary Department

Comply consistent with the requirements of Section 7.18.

10.8 Personal Care Unit for Inpatients

A separate room, with appropriate fixtures and utilities, or facilities within each inpatient room, shall be provided for patient grooming.

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 be in addition to other toilet and bathing requirements. The facilities shall be similar to a residential environment so that the patient may learn to use them before returning home.

10.10 Administration and Public Areas

Facilities shall be provided consistent with the requirements of Section 7.19.

10.11 Engineering Service and Equipment Areas

Facilities shall be provided consistent with the requirements of Section 7.27.

10.12 Linen Services

Facilities shall be provided consistent with the requirements of Section 7.23.

10.13 Housekeeping Room(s)

Facilities shall be provided consistent with the requirements of Section 7.26.

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 assigned to 1st and 2nd shifts shall be provided.

10.15 Nursing Unit (for Inpatients)

Where inpatients are a part of the facility, all facilities used by patients (i.e. sleeping, toilet, bathing, day/dining) shall comply with accessibility requirements of the Michigan Building Code with each nursing unit providing the following.

10.15.A Each patient room shall meet the following requirements:

10.15.A1 Maximum room occupancy shall be consistent with the requirements of Section 7.2.A1.

10.15.A2 Minimum room areas shall be consistent with the requirements of Section 7.2.A2., except that 140 square feet of clear floor space shall be provided in single-bed rooms and 125 square feet per bed in multi-bed rooms.

10.15.A3 Each patient sleeping room shall have a window consistent with Section 7.28.A10.

10.15.A4 (Not Used)

10.15.A5 (Not Used)

10.15.A6 Toilet facilities which meet shall be provided consistent with the requirements of Section 7.2.A5.

10.15.A7 Each patient shall have a wardrobe, closet, or locker with minimum clear dimensions of 1 foot 10 inches by 1 foot 8 inches. An adjustable clothes rod and adjustable shelf shall be provided.

10.15.A8 Visual privacy shall be provided for each patient in multi-bed rooms consistent with the requirements of Section 7.2.A7.

10.15.B Facilities shall be provided consistent with the requirements of Section 2.7., except that:

- a. Clear floor space for examination/treatment rooms shall comply with Section 10.2.B.
- b. Day/dining spaces shall be provided on the unit and comply with Section 10.6.

10.15.C 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. At least one bathing fixture designed for assisted bathing shall be provided in each nursing unit. 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 4 feet by 4 feet square, curb-free, and designed for use by a wheelchair patient. Central bathing facilities shall have access to handwashing and toilet facilities without entering the corridor.

Provide for storage of soap, towels, and other supplies within these facilities.

- 10.15.D** Provide at least one toilet training room consistent with operational narrative, that includes handwashing facilities, 3'-0" clearances in front and on each side of the water closet, and grab bar on one side capable of moving out of the way.
- 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. These 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 operational narrative, a system for sterilizing equipment and supplies shall be provided consistent with Section 7.21.
- 10.17.** **Physical Therapy Unit**
- Facilities shall be consistent with the requirements of Section 7.13.C.
- 10.18.** **Occupational Therapy Unit**
- The following elements shall be provided (or shared with physical therapy facilities consistent with the operational narrative and as appropriate):
- 10.18.A** Office Space
- 10.18.B** Waiting Space
- 10.18.C** Activity Areas
- 10.18.D** Storage for Supplies and Equipment
- 10.18.E** (Not Used)
- 10.19** **Prosthetics and Orthotics Unit**
- Facilities shall be provided consistent with the requirements of Section 7.13.E.
- 10.20** **Speech and Hearing Unit**
- This shall include:
- 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:
- 10.21.A** Operatory

10.21.B Laboratory and Film Processing Facilities

10.22 Imaging Suite

When required by the operational narrative, facilities shall be provided consistent with the requirements of Section 7.10.

10.23 Pharmacy Unit

Facilities shall be provided consistent with the requirements of Section 7.17.

10.24 Details and Finishes

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:

A.10.24 Patients in a rehabilitation facility will be disabled to differing degrees. Therefore, higher standards of safety for the occupants should be provided to minimize accidents.

10.24.A Facilities shall be consistent with the requirements of Section 7.28.A., as well as the following:

10.24.A1 (Not Used)

10.24.A2 (Not Used)

10.24.A3 (Not Used)

10.24.A4 Where the operational narrative 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 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 (Not Used)

10.24.A7 (Not Used)

10.24.A8 (Not Used)

10.24.A9 Provide windows consistent with Sections 7.28.A9, 7.28.A10, and 7.28.A11.

10.24.A10 (Not Used)

10.24.A11 (Not Used)

10.24.A12 (Not Used)

10.24.A13 Special consideration shall be given to shower curtain rods, robe hooks, and towel bars or rings which 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. Cross-sectional characteristics of handrails shall comply with sections 505.5, 505.6, 505.7, 505.8, and 505.9 of ICC/ANSI 117.1-1998

- 10.24.A16 Ends of handrails and grab bars shall be constructed to prevent snagging the clothes of patients. Handrails shall be finished to minimize potential for personal injury.
- 10.24.B** Finishes
- Finishes shall be consistent with the requirements of Section 7.28.B.
- 10.25.** Surgical suites if provided shall be consistent with requirements of Section 7.7 and the operational narrative
- 10.26** Laboratories if provided shall be consistent with requirements of Section 7.12 and the operational narrative
- 10.27** Medical records storage shall be consistent with requirements of Section 7.20 and the operational narrative.
- 10.28** General stores shall be consistent with requirements of Section 7.22 and the operational narrative
- 10.29** Cart cleaning facilities shall be consistent with requirements of Section 7.24 and the operational narrative
- 10.30** **Special Systems**
- 10.30.A** (Not Used)
- 10.30.B** Elevators shall be consistent with the requirements of Section 7.30.B.
- 10.30.C** Provisions for waste disposal shall be consistent with the requirements of Section 7.30.C.
- 10.31** **Mechanical Standards**
- Mechanical systems shall be consistent with the requirements of Section 7.31.
- 10.32** **Electrical Standards**
- All electrical systems shall be consistent with the requirements of Section 7.32.
- 11** **PSYCHIATRIC HOSPITAL**
- 11.1.** **General**
- 11.1.A** This section applies to psychiatric hospitals that are licensed separately from acute care hospitals (chapter 7) and provide care for inpatients and outpatients. See section 7.6 for psychiatric units within acute care hospitals.
- 11.1.B** There shall be for each project an operational narrative for the facility consistent with Section 1.1.C.
- 11.1.C** The psychiatric hospital shall meet all the standards described herein. Deviations shall be described and justified in the operational narrative for specific approval by the AHJ.
- 11.1.D** See section 7.1.D (parking)

11.1.E See Section 1.6 (HIPAA).

11.2 Non-Clinical Support Facilities

Comply with the operational narrative and the following sections:

11.2.A Section 7.18 (Dietary)

11.2.B Section 7.19 (Administrative and Public)

11.2.C Section 7.20 (Medical Records)

11.2.D Section 7.22 (General Stores)

11.2.E Section 7.23 (Linen Services)

11.2.F Section 7.24 (Cart Cleaning Services)

11.2.G Section 7.25 (Staff Facilities)

11.2.H Section 7.26 (Housekeeping Rooms)

11.2.I Section 7.27 (Engineering Services and Equipment Areas)

11.3 Clinical Facilities

11.3.A See section 7.6. (Inpatient Psychiatric Units)

11.3.B The number of seclusion rooms provided shall comply with the operational narrative.

11.3.C Provide the number of airborne isolation rooms in accordance with section 5.1. The design of the room(s) shall comply with section 7.2.C.

11.3.D Provide storage for 7 changes of clothes per patient.

11.3.E Provide additional storage for pediatrics to accommodate extra cribs/beds, educational materials, toys, and cots or recliners for parents who stay overnight.

11.3.F Intensive or forensic units shall have a security vestibule provided at the entrance.

11.3.G Provide a quiet room with at least 80 s.f. of clear floor space and 8 foot minimum room width for visitation or when a patient needs to be alone but does not require a seclusion room.

11.3.H Patient laundry facilities with commercial grade automatic washers and dryers, soak sink, and work counter.

11.3.I Comply with operational narrative and section 7.10 (Imaging)

11.3.J Comply with operational narrative and section 7.12 (Laboratory)

11.3.K Comply with operational narrative and section 7.13 (Rehabilitation Therapy)

11.3.L Provide facilities to support the operational narrative in regards to recreational therapy (such as gymnasium, outdoor spaces, and equipment storage).

- A.11.3.L The operational narrative and design should reflect the therapeutic need for secure and protective outdoor spaces in addition to the various social, occupational, and group therapy.
- 11.3.M** Provide facilities to support the operational narrative in regards to educational patient needs. Classrooms shall provide a minimum of 150 s.f. of clear floor area; 30 s.f. per student; desk and lockage storage for teacher; and storage for various supplies.
- 11.3.N** Provide morgue and autopsy facilities consistent with the requirements of the operational narrative and Section 7.16.
- 11.3.O** Provide a pharmacy consistent with the requirement of the operational narrative and Section 7.17.
- 11.4 Details**
- 11.4.A** Minimum door width shall be 36 inches.
- 11.4.B** Patient toilet room or shower stall doors shall swing outward or be double-acting.
- 11.4.C** Door closers are to be avoided unless otherwise required.
- 11.4.D** Provide continuous or cut door hinges to prevent injury.
- 11.4.E** Door lever handles shall point downward when in the latched position.
- 11.4.F** All fasteners shall be tamper resistant.
- 11.4.G** Windows shall comply with sections 7.28.A9, 7.28.A10, 7.28.A11, and shall be fabricated of laminated safety glass or equivalent to prevent elopement or falls.
- A.11.4.G Windows should be constructed and installed to not allow more than a 4 inch diameter sphere to pass, or allow for the glazing to pop out and for the frame and sash to remain intact from a 500 pound impact.
- 11.4.H** Robe hooks shall be collapsible.
- 11.4.I** Closet rods, shower rods, towel bars, non-recessed soap dishes, goose-neck spouts, or lever handles on plumbing fixtures shall not be permitted.
- 11.4.J** Furnishings shall be constructed to withstand physical abuse.
- 11.4.K** Drawer pulls and shower heads shall be recessed to prevent being used as a tie-off.
- 11.4.L** Mirrors shall be polished stainless steel.
- 11.4.M** See section 7.28.A20 (Ceiling heights)
- 11.4.N** See section 7.28.A22 (heating producing rooms)
- 11.4.O** See section 7.28.A23 (sound transmission standards)
- 11.4.P** See section 7.28.A27 (cleanability of equipment)
- 11.4.Q** See section 7.28.A30 (exposed hot surfaces)
- 11.5 Finishes**
- 11.5.A** Ceilings shall be tamper-resistive to prevent patient access.

- 11.5.B** All piping, ductwork, and conduits shall be concealed in clinical areas.
- 11.5.C** Ventilation grilles shall be secured and have small perforations to eliminate their use as a tie-off and to prevent elopement.
- 11.5.D** Sprinkler heads shall be recessed.
- 11.5.E** Sprinkler heads, light fixtures, and other appurtenances shall be tamper-resistant.
- 11.5.F** See section 7.28.B4 (floor materials)
- 11.5.G** See section 7.28.B6 (wall finishes)
- 11.5.H** See section 7.28.B7 (floor and wall penetrations)
- 11.5.I** See section 7.28.B10 (radiation shielding)

11.6 Elevators

See section 7.30.B

11.7 Waste Processing Services

See section 7.30.C

11.8 Mechanical Standards

Comply with section 8.31 except that the design temperature range for patient occupied rooms shall be designed and maintained to remain between 70 and 75° F.

11.9 Electrical Standards

Comply with section 7.32 unless noted below:

- 11.9.A** Panel boards shall not be accessible to patients.
- 11.9.B** All electrical receptacles in clinical areas shall be safety type or GFI protected.
- 11.9.C** A nurse call system shall be provided consistent with 7.32.G, except provisions shall be made for easy removal and/or covering of call buttons and call cords shall not exceed 6 inches in length.

12 MOBILE, TRANSPORTABLE, AND RELOCATABLE UNITS

12.1 General Considerations

There shall be for each project an operational narrative for the facility consistent with Section 1.1.C. The design and construction of the project shall be consistent with the operational narrative.

The facility shall meet all the standards described herein. Deviations shall be described and justified in the operational narrative for specific approval by the AHJ.

Mobile, transportable, and relocatable units (herein called units) shall be approved by the Michigan Department of Labor and Economic Growth Bureaus of Construction Codes and the Bureau of Fire Services. Units, except for MRI, shall also be approved by the Radiological Safety Section of the MDCH.

12.2 Definitions

- 12.2.A** Mobile Unit: Any pre-manufactured structure, trailer, or self-propelled unit, designed to be moved on a daily basis to provide facilities for imaging, lithotripsy, diagnostic cardiac catheterization, or other medical services.
- 12.2.B** Transportable Unit: Any pre-manufactured structure or trailer designed to provide for imaging, lithotripsy, diagnostic cardiac catheterization, or other medical services at the same location on an extended temporary basis.
- 12.2.C** Relocatable Unit: Any structure, not on wheels, built to be relocated at any time and provide medical services.
- 12.2.D** Host Facility: A Hospital, Freestanding Surgical Outpatient Facility, or other licensed healthcare facility at which the unit facilitates patient examination or treatment.
- 12.2.E** Support Facility: An addition to or renovated space within the host facility designed to accommodate functions associated with one or more units. Support facilities can include the dock, connecting corridor, service areas, patient locker rooms, patient preparation/recovery facilities, and waiting areas.

12.3 General Requirements

- A.12.3** It is recommended that the docking facility for mobile units be level with the floor of the mobile units; that an inflatable weather seal be used to protect patients from moisture, wind, and extreme temperatures; and that both the patient and staff access doors fit within the weather seal.
- 12.3.A** Support facilities shall have appropriately sized utilities, including emergency power, water, waste, telephone, and fire alarm connections to serve the unit(s).
- 12.3.B** Patient access to the unit shall not be through non-patient areas of the host facility, such as loading docks, office suites, or warehousing spaces.
- 12.3.C** Patient access to the unit shall be through a permanent enclosure so as to protect patients from inclement weather (precipitation and temperature extremes), vermin, and filth.
- 12.3.D** Patient access to the mobile or transportable unit(s) shall be by ramp or mechanical lift equipped with guardrails.
- 12.3.E** Handwashing facilities for the unit(s) and support facility shall be consistent with the requirements of Section 2.1.A.
- 12.3.F** Crash cart and oxygen shall be conveniently located to the unit and support facility.

12.4 Site Requirements

- 12.4.A** Access for the unit to arrive (turning radius of vehicles, slopes of the approach, etc.) shall be taken into consideration.

12.4.B Mobile support facilities shall have level concrete pads for parking the unit(s) when in use.

12.5 Support Facility Requirements

Support Facility Requirements shall be consistent with the requirements of Section 7.10.B.

12.6 Magnetic Resonance Imaging Unit Requirements

Mobile MRI units shall be consistent with the requirements of Section 7.10.B15.

12.6.A An enclosure (such as a fence) with clearly visible warning signage shall be provided around Magnetic Resonance Imaging (MRI) units at or beyond the 5 gauss field-strength limit. Radio frequency interference with nearby vehicles, and individuals with electronic pacemaker implants shall be considered in site design.

12.7 Cardiac Catheterization Unit Requirements

12.7.A A scrub sink shall be provided within the unit.

12.7.B A weather-tight dock seal shall be provided between the unit and the support facility.

12.8. General Standards for Details and Finishes

12.8.A Details and finishes for support facilities shall be consistent with the requirements of Section 7.28.

12.8.B Mobile Units

12.8.B1 Details and finishes for mobile units shall be consistent with the requirements of Sections 7.28.A13., 7.28.A16 - 30, and 7.28.B.

12.8.B2 Doorway clear openings in mobile units shall accommodate transport of patient stretchers from the support facility to the procedure table.

12.8.B3 Clear floor spaces in mobile units shall accommodate routine transport of patient stretchers from the support facility to the procedure table, staff access on both sides and the foot of the procedure table.

12.8.B4 Radiation protection for X-ray and gamma ray installations shall be in accordance with Michigan's Ionizing Radiation Rules and NCRP Reports, Numbers 49 and 51.

12.8.C Transportable and Relocatable Units

12.8.C1 Details and finishes for transportable and relocatable units shall be consistent with the requirements of Section 7.28.

12.8.C2 Radiation protection for X-ray and gamma ray installations shall be in accordance with Michigan Public Code Act 368, part 135 Radiation Control.

Testing in accordance with NCRP 147 will be accepted as compliant with these rules.

12.9 - 30 Reserved

12.31 Mechanical Standards

- 12.31.A** Transportable Units, Relocatable Units, and Support Facilities shall be consistent with the mechanical requirements of the host facility (Section 7.31. for hospitals, Section 8.31. for nursing facilities, or Section 9.8. for freestanding surgical outpatient facilities).
- 12.31.B** Mobile Units
- 12.31.B1 Units shall be consistent with the mechanical requirements of Sections 7.31.A, 7.31.B, 7.31.D, 7.31.E3.a, 7.31.E3.b, 7.31.E4.g, 7.31.E5, 7.31.E6, 7.31.E7, and 7.31.E9. HVAC filters for cardiac catheterization shall comply with MERV 13 requirements.
- 12.31.B2 Domestic air intakes in the unit, support facility, and host facility shall be located away from all exhaust fans and sources of combustion fumes, including the unit's emergency generator compliant with Section 7.31.D3.
- 12.31.B3 Water and sanitary waste lines from the unit shall be provided with a means of freeze protection.
- 12.31.B4 Backflow prevention shall be installed at the point of water connection on the unit.
- 12.32 Electrical Standards**
- 12.32.A** Transportable Units, Relocatable Units, and Support Facilities shall be consistent with the electrical requirements of the host facility (Section 7.32. for hospitals, Section 8.32. for nursing facilities, or Section 9.9. for freestanding surgical outpatient facilities).
- 12.32.B** Mobile Units
- 12.32.B1 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.B2 (Not Used)
- A.12.32.B2 The electrical installations, including alarm, nurse call, and communication systems should be tested to demonstrate that equipment is functional each time a unit is connected.
- 12.32.B3 (Not Used)
- 12.32.B4 On mobile units an external electrical disconnect switch shall be provided that is capable of being locked in the on and off positions. The plug connectors (power and communications) serving mobile units shall be located in an improved, well drained area.
- 12.32.C** Switchboards, overload protective devices, and panelboards for mobile units shall be consistent with the requirements of Section 7.32.B.
- 12.32.D** (Not Used)
- 12.32.E** Lighting for mobile units
- 12.32.E1 Lighting shall be consistent with the requirements of Section 7.32.D.
- 12.32.E2 Light fixtures shall be equipped with lenses or shields for protection of the lamps or with lamps that will not shatter.
- 12.32.F** Duplex grounded-type receptacles (convenience outlets) for mobile units shall be installed in all areas in sufficient quantities for tasks to be performed consistent with the requirements of Section 7.32.E. Each examination and work table shall have access to a minimum of two duplex receptacles.

- 12.32.G** Equipment for mobile units (Not Used)
- 12.32.H** Emergency Electrical Service for mobile units
 - 12.32.H1 Emergency lighting and power shall be provided consistent with NFPA 99, NFPA 101, and NFPA 110.
 - 12.32.H2 Cardiac catheterization units shall be served by emergency power.
- 12.32.I** Fire Alarm System for mobile units (Not Used)
- 12.32.J** Telecommunications and Information Systems for mobile units
 - 12.32.J1 Locations for terminating telecommunications and information system devices shall be located on the unit and support facility 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.

13 HOME FOR THE AGED

- A.13 Construction and renovations requirements for Home For the Aged (HFA) facilities are governed under Michigan licensing rules promulgated via the authority of section 213 and following as well as section 325.1901 and following of the P.A. 368 (the Public Health Code). These facilities may be freestanding or as distinct part sharing a building with a licensed nursing home.

14 HOSPICE

- A.14 Construction and renovations requirements for freestanding and separately licensed Hospice facilities are governed under Michigan licensing rules promulgated via the authority of section 214 and following as well as section 325.13101 and following of the P.A. 368 (the Public Health Code).

Table 8

Illumination of Health Care Facilities

The following tables are intended to be representative, not inclusive of all clinical facilities. These measured minimum foot-candle (fc) values shall be provided at 36 inches above the floor or at task locations as applicable and shall account for bulb and fixture depreciation.

One-half (1/2) of the lighting levels shall be maintained in Operating Rooms, Delivery Rooms, Trauma Rooms and Emergency Department Exam Rooms, Nursing Stations, Intensive Care Rooms, Special Care Nurseries, Full Term Nurseries, Angiography Labs, Interventional Radiology Rooms, Cardiac Catheterization Labs, Resuscitation Areas, PACU, Patient Holding Areas, Medication Preparation and Dispensing Areas, and work areas within the Laboratory, when on Emergency Power. These levels are not required during the (10 seconds max) transfer to Emergency Power.

Operating/Delivery/Trauma Rooms¹ 150 fc

These illumination levels shall be provided within a six foot perimeter of the table/stretcher with the remainder of the room provided with a minimum of 75 fc.

Critical Task Areas 75 fc

Cardiac Catheterization Labs¹
 Angiography¹
 Interventional Radiology¹
 Scrub sinks
 Central Sterile task locations
 Patient exam/treatment locations²
 Decontamination task locations
 Pharmacy and Laboratory hoods
 Intensive Care bed and bassinet locations¹
 LDR/LDRP bed locations¹
 PACU/Cardiovascular recovery¹
 Procedure rooms²
 Autopsy¹

The 75 fc is the minimum for patient examination, resuscitation, or a procedure in the patient vicinity. The patient vicinity is defined as three feet around the sides and head of the patient bed/table. The remainder of these rooms shall be a minimum of 15 fc.

The 75 fc level is required in some areas for patient emergencies and resuscitation events. It is not intended to require this lighting level during normal procedures, such as cardiac catheterizations.

Illumination of Health Care Facilities (Continued)

Specialized Task Areas 50 fc

Food service work counter
Medication preparation and dispensing locations
Nurse, Physician and Clinician (paper) charting locations
Laboratories
Triage areas
Hot Lab task locations
Dialysis Patient Locations

Task Areas 30 fc

Patient care bed, stretcher, table, and chair locations (non-exam)
Resident bed locations
Handwashing, water closets, and tub/shower
Staff work counter
Patient and resident day/dining rooms
Patient and resident reading locations
Patient Preparation and holding areas
General Radiology Rooms, MRI, PET, CT, and Lithotripsy
Morgue

General Areas 15 fc

Corridors³
General patient and resident room/location
Clean and soiled utility rooms (see above for work counters)
Clinical storage/holding
Locker rooms
Janitor closets
Stairways, elevators, waiting rooms

¹Fixed task lighting (shall be on emergency power)

²Task lighting consistent with 7.32.D8

³At least 5 fc of illumination shall be provided for night lighting.

It is recommended that 1 fc of illumination be provided in operating, delivery, and trauma rooms during transfer to emergency power.

Note that the above requirements are enforced during licensing and certification inspections.

Health Care lighting levels may be exempt from the Energy Code. However, it is prudent to evaluate the facility lighting plan as part of an overall energy conservation program.

Control options are permitted to allow for partial illumination levels to accommodate user preferences.

Table 9
Electrical Convenience Receptacles Requirements for Clinical Areas

| Area Designation | Number | Locations |
|---|---------------|--|
| Patient Bed Locations | | |
| Medical, Surgical, Pediatric, Postpartum, Physical Rehabilitation | 12 | Convenient to head of bed with one on each wall. |
| Critical Care/Neonatal ICU/Pediatric ICU (and associated exam/treatment) | 16 | Convenient to head of bed with one on each wall. |
| Psychiatric/Substance Abuse | No minimum | |
| Newborn Nursery | 4 | Convenient to each bassinet. |
| Special Care Nursery | 8 | Convenient to each bassinet |
| Post Anesthesia Care - Stage 1 | 8 | Convenient to head of stretcher or bed. |
| Post Anesthesia Care - Stage 2 | 4 | Convenient to stretcher or chair. |
| Operating Rooms/Delivery Rooms | 24 | 16 convenient to table placement with two on each wall |
| LDR/LDRP | 16 | 8 convenient to head of mother's bed and 4 convenient to each bassinet with one on each wall |
| Trauma/Resuscitation/Cardiac emergency room/minor (no general anesthesia) surgical room | 16 | Convenient to head of stretcher or bed. |
| Emergency Care - general | 12 | Convenient to head of stretcher or bed. |
| General Examination/Treatment rooms | 8 | 4 convenient to head of stretcher or bed. |
| Cardiac Catheterization/Interventional Radiology/Angiography | 12 | 8 convenient to table placement with one on each wall |
| Endoscopy, Bronchoscopy, Non-Surgical Cystoscopy, Lithotripsy, Urology | 8 | |

Notes:

1. May be single or duplex type or a combination of both.
2. Consideration shall be given to providing some outlets on emergency power and some on normal power at the head of patient beds, OR's, Delivery Rooms, and Trauma/Resuscitation/Cardiac emergency rooms in case of transfer switch failure.
3. Each patient bed location or procedure room shall be supplied by at least two branch circuits, one from the emergency system and one or more from the normal system. Critical care locations served from two separate transfer switches on the emergency system shall not be required to have separate circuits from the normal system
4. Branch circuits serving only special purpose receptacles or equipment in critical care areas shall be permitted to be served by other panel boards.
5. Provide an additional outlet for a television if furnished in room.
6. Provide a minimum of one dedicated circuit to each critical care patient location.
7. Open Heart Post-Anesthesia Recovery Spaces will require outlets beyond that specified above based on the operational narrative.

Table 10
Location of Nurse Call Devices

KEY:
 ● Required
 □ Optional, but must be justified

| Area Designation | Patient Station | Patient Bath Station | Emergency Signal Station | Code Call Station | Nurse Master Station | Duty Station | Notes |
|---|-----------------|----------------------|--------------------------|-------------------|----------------------|--------------|------------|
| Nursing Units | | | | | | | |
| Inpatient Bed Location | ● | | ● | □ | | | 1, 2, 3, 4 |
| Patient Water Closets, Showers, and Baths | | ● | | | | | 2 |
| Nurse/Control Station | | | | | ● | | |
| Clean Utility (Section 2.7.F) | | | | | | ● | |
| Clean Supply Room | | | | | | □ | |
| Soiled Utility (Section 2.7.G) | | | | | | ● | |
| Soiled Holding Room | | | | | | □ | |
| Medication Preparation Room (Section 2.7.H) | | | | | | ● | |
| Examination/Treatment Room (Section 2.7.E) | □ | | ● | | | ● | |
| Nurse Lounge (Section 2.7.U) | | | | | | ● | |
| Clean Linen Storage (Section 2.7.I) | | | | | | □ | |
| Nourishment Station (Section 2.7.J) | | | | | | □ | |
| Equipment Storage Room (Section 2.7.L) | | | | | | □ | |
| Multi-Purpose Room (Section 2.7.D) | | | | | | □ | |
| Other Clinical Areas | | | | | | | |
| Operating/Delivery Rooms (Sections 7.7.A, 7.8.A, & 9.3) | | | ● | □ | | | 2 |
| Procedure Rooms (Section 7.11) | | | ● | □ | | | 2 |
| LDR/LDRP (Section 7.8.A) | ● | | ● | ● | | | 1, 2, 3, 4 |
| Recovery - Phase 1 (Sections 7.7.B & 7.8.A) | □ | | ● | ● | □ | | 2, 4 |
| Recovery - Phase 2 (Sections 7.7.C & 9.3) | ● | | ● | □ | □ | | 1, 2 |

Table 10 (Continued)
Location of Nurse Call Devices

KEY:

- Required
- Optional, but must be justified

| Area Designation | Patient Station | Patient Bath Station | Emergency Signal Station | Code Call Station | Nurse Master Station | Duty Station | Notes |
|---|-----------------|----------------------|--------------------------|-------------------|----------------------|--------------|------------|
| Other Clinical Areas | | | | | | | |
| Emergency Exam/Treatment/Triage | ● | | ● | ● | □ | | 1, 2, 4 |
| Patient Preparation and Holding Areas | ● | | ● | □ | □ | | 1, 2 |
| Critical Care Bed Locations, inc. NICU | ● | | ● | ● | □ | | 1, 2, 4, 5 |
| Newborn and Special Care Nurseries | | | ● | | □ | | |
| Cardiac Cath/Interventional Rad/Angiography | □ | | ● | ● | □ | | |
| MRI, CT, Stress Testing Areas | □ | | ● | ● | | | 2, 4 |
| Outpatient Examination Areas | □ | | | □ | | | |
| Outpatient Waiting and Changing Areas | □ | | | | | | 2 |
| Psychiatric Seclusion Ante/Exam Rooms | | | ● | | | | |
| Outpatient Toilet Rooms/Showers/Baths | | □ | | | | | 2 |
| Psychiatric Patient Room | □ | | | | | | 2 |

Notes:

1. One device may accommodate both Patient Station and Emergency Staff Assistance Station functionality.
2. Must activate a visible signal in the corridor at the patient's door, at the Nurse/Control station and all duty stations.
 In multi-corridor nursing units, additional visible signals shall be installed at corridor intersections.
3. Provide 2-way voice communication with Nurse/Control Station.
4. One device may accommodate both Emergency Staff Assistance and Code Call Station functionality
5. Patient Station not required in NICU

APPENDIX A

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American Society for Testing and Materials (ASTM)
1916 Race Street
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Illuminating Engineering Society of North America (IESNA)
IES Publication Sales
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Michigan Department of Community Health (MDCH)
Bureau of Health Systems – Division of Health Facilities & Services
Health Facilities Engineering Section (HFES)
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Lewis Cass Building – 3rd Floor
Lansing, MI 48913

www.michigan.gov/hfes

Michigan Department of Community Health (MDCH)
Bureau of Health Systems – Division of Health Facilities & Services
Radiation Safety Section (RSS)
611 W. Ottawa Building – 1st Floor, P. O. Box 30664
Lansing, MI 48909
517-241-1989

www.michigan.gov/rss

Michigan Department of Labor & Economic Growth (DLEG)
Bureau of Construction Codes
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Okemos, MI 48864
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