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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 Hospital and Health Care Facilities.

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Core Committee Members:

John Ballew
University of Michigan Hospital & Health Centers

Judene Bartley, MS, MPH, CIC
VP Epidemiology Consulting Services

Dick Davidson
Spectrum Health – Reed City

Robert (Bob) Glowinski
Beaumont Hospitals – Beaumont Services Co.

Rod Jones
Genesys Regional Medical Ctr.

Jeff McManus, P.E.
Michigan Dept. of Community Health

Irvin Poke
Michigan Dept. of Labor and Economic Growth

Jim Scott, P.E.
Michigan Dept. of Community Health

John Titus, P.E.
Tower, Pinkster, Titus Associates

Kasra Zarbinian, P.E.
Michigan Dept. of Community Health

Edward A. Barry, P.E.
McMillian Associates Inc.

Daniel Caren, AIA
Harley Ellis Devereaux

Betty Ann Eash
Mid Michigan Medical Center – Midland

Richard Gudkese, CHFM
Facilities Management Consulting

Diane Lessien
Beta Design

Michael Pacheco
Albert Kahn Associates

David Salisbury
D. W. Salisbury Group

Art Veneklause, P.E.
URS Corporation

Pier-George Zanoni, P.E.
Michigan Dept. of Community Health

Resource Individuals:

Candace Carver
Oakwood Hospital and Medical Center

Linda Kirk
Spectrum Health System

Penny Sabrosky, BS, CSPDT
Spectrum Health System

Nancy Johnson, R.N., C.N.N.
Great Lakes Renal Network

Beth Miller, R.N., CASC
Eastside Endoscopy Center

Heidi Shepard
William Beaumont Hospital

THE 2006 MINIMUM DESIGN STANDARDS

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.

~~An asterisk (*) preceding a paragraph number indicates that explanatory or educational material can be found in Appendix A.~~

Highlighted text is advisory only in nature.

1.1.B (Not Used)

The Health Care Financing Administration, 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*, 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.

1.2 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 Michigan Department of Community Health (MDCH) may grant approval to deviate from the design standards if:

1. The facility in question is currently in operation,

2. The licensure status of the facility is not proposed to change,

3. The existing facility meets current fire safety rules, or is approved for continued operation by the Michigan Office of Fire Safety, and

4. An operational narrative is provided which:

   a. Indicates those rooms, areas, or equipment that cannot be accommodated;

   b. Indicates all building constraints that preclude inclusion of specific elements; and

   c. 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 and with appropriate parts of NFPA 101 covering New Health Care Occupancies.

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

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

- If an existing hospital has 6 foot (1.83 meters) wide corridors, these corridors could not be reduced in width during renovations, even though the requirements for existing buildings do not require 6 foot (1.83 meters) wide corridors.

- If a hospital has 10 foot (3.05 meters) wide corridors, they may be reduced to 8 feet (2.44 meters) width, which is the requirement for new construction.

- If a hospital were to have a passageway that is only 3 feet (0.9 meter) wide, it would have to be increased to 4 feet (1.22 meters), which is the minimum requirement for existing buildings.

- If the hospital has an existing 7 foot (2.13 meters) wide corridor that is to be replaced during renovations, it would normally be required to be increased to 8 feet (2.44 meters). However, if the buildings column spacing limits corridor width to 7 feet (2.13 meters), and there is no easy or practical way to achieve an 8 foot (2.44 meters) corridor width, the Department would judge if a 7 foot (2.13 meters) corridor is adequate.

1.3 Design Standards for the Disabled

Health care facility construction shall meet the Barrier Free Design 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 ~~hurricanes, tornadoes, flooding, earthquake, or other regional disasters~~ *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.

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

1.4.A ~~Facilities shall be designed to meet the requirements of the local building codes provided these requirements are substantially equivalent to ASCE 7-93.~~

Facilities shall 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.

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

1.5.A Insofar as practical, these minimum Standards have been established to obtain a desired performance result. Prescriptive limitations, when given, such as exact minimum dimensions or quantities, describe a condition that is commonly recognized as a minimum practical standard for normal operation.

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

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)* ~~English/Metric Measurements~~

~~Metric standards of measurement are the norm for most international commerce and are being used increasingly in health facilities in the United States. Where measurements are a part of this document, English units are given as the basic standards with metric units in parenthesis.~~

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 the Appendix. 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 retitled. Care must be taken to insure that appropriate sections are used.

~~***1.5.D.** Availability of Codes and Standards~~

~~Copies of publications can be obtained at the addresses listed in the Appendix.~~

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.

Healthcare providers must 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.

Healthcare 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:

- *The use of sound absorbent materials with high STC ratings for ceilings, walls/partitions and floors.*
- *Partial to full enclosure of key patient encounter spaces.*
- *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.*
- *The use of acoustic boots in ductwork serving multiple rooms.*
- *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:

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

2 DEFINITIONS

2.1 General

2.1.A Handwashing facilities shall be basins with *a* minimum *depth of 6". 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.* ~~dimensions of 12 inches (30 cm) x 12 inches (30 cm) x 6 inches (15 cm) deep to wash hands.~~ Each basin shall be equipped with hot and cold water supplied through trim such as gooseneck inlets or other types of inlets which discharge at a point at least 5 inches (13 cm) above the rim of the basin and controls which can be operated without the use of hands. Where wrist blades are provided, they shall be at least 4 inches (10.2 cm) in length. Soap and a system to dry hands shall be provided at each handwashing facility.

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

Handwashing facilities shall be located at least 36 inches (91 cm) from patients or storage of clean/sterile materials or shall be equipped with splash guards so as to avoid splash contamination.

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.

Handwashing facilities and lavatories shall be securely anchored to withstand an applied vertical load of not less than 250 pounds (113.4 kilograms) on the fixture front.

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

Handwashing facilities where provided in 2.1.A.1 shall be required to operate during the loss of normal power.

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

    a. ~~Nourishment & food preparation areas;~~ *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.*

    b. ~~Soiled work rooms;~~ In addition to work sinks in soiled utility, sub-sterile, anesthesia work, flash sterilization, or decontamination rooms.

    c. Laboratories where chemical or microbial materials may be present;

    d. Areas where staff have direct physical contact with patients (except in operating rooms and delivery rooms);

    e. Areas or rooms where staff ~~carry out~~ *perform* an invasive activity, such as drawing blood, or starting an IV;

    f. Areas or rooms where clean or sterile items may be set up or manipulated;

    g. Pharmacies and medicine preparation rooms;

    h. Resident and patient dining rooms;

    i. Both toilet rooms and patient rooms in acute care facilities;

    ~~j. Either toilet rooms or resident rooms in long term care facilities.~~ *Handwashing facilities serving MRI scanner and related technology can*

be located immediately outside the scan room if patient preparation occurs outside the room.

2. Handwashing facilities shall be conveniently located as follows:

   a. Within a 15 foot (4.6 meters) travel distance of all inpatient (including outpatient PACU) bassinet, bed, stretcher, and examination/treatment locations, *including patient care areas in Emergency Department;*

   b. Within a 25 foot (7.6 meters) 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;

   c. Within the same room or space; and

   d. In clear unobstructed areas, not hidden behind cubicle curtains, columns, or doors, or in areas which are used for equipment/material storage.

Handwashing is the single most important method to prevent hospital infections. 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 sins 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 6 ½" deep maximum.

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*

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.

Porcelain stainless steel or solid surface materials are more desirable based on their impervious nature.

It was not the committee's intention to require those handwashing facilities described in 2.1.A.1 (typically, staff handwashing locations) to be operated off of the normal power system. Handwashing facilities can have manual valves or be battery operated. If they are powered through the normal power system they will need to be connected to the emergency power system critical branch.

2.1.B New construction means creation of new architectural space outside of the confines of existing floors, walls, and roofs.

2.1.C Patient holding areas, ~~including preoperative holding, *emergency departments, outpatient surgical recovery, outpatient dialysis treatment, endoscopy preparation/recovery,* and post-anesthesia care units, (recovery)~~ shall provide the following:

1. A minimum of 100 square feet (9.3 square meters) of clear floor area shall be provided per bed or stretcher that is located in a single-bed room.

2. A minimum of 80 square feet (7.4 square meters) of clear floor area shall be provided per bed or stretcher that is located in a multiple-bed room, *exclusive of the required circulation space with a minimum head wall dimension of 8 feet (2.46 m).*

3. A minimum of 50 square feet (4.6 square meters) of clear floor area shall be provided per *patient* chair that is located in a multiple-chair room, *exclusive of the required circulation.*

4. A minimum of 4 feet (1.2 meters) of clear space shall be provided at the foot of a bed, stretcher or chair in multiple patient rooms as an aisle for equipment access.

5. A minimum of 4 feet (1.22 m) shall be provided between beds ~~stretchers or chairs, and a minimum of 4 feet (1.2 meters) shall be provided between an adjacent wall and the side of a bed, stretcher or chair.~~ *or stretchers and between an adjacent wall and the side of a bed or stretcher. A minimum of 3 feet (0.92 m) shall be provided between patient chairs and between an adjacent wall and the side of a patient chair.*

6. Provisions for airborne infection isolation shall be determined by the Infection Control Risk Assessment Group consistent with Section ~~2.1.G~~ *5.1.A*.

7. Cubicle curtains shall be provided for each patient station in a multiple station room, for privacy.

8. Patient areas shall be under the visual control of the nursing staff. (See A7.3.A11.)

9. Handwashing facilities shall be provided consistent with Section 2.1.A.

10. Patient toilet facilities at a ratio of one per eight patient stations, or fraction thereof, shall be provided in holding, recovery, or treatment areas where patients are ambulatory. These toilet facilities must be accessible without entering a general corridor.

11. Support spaces such as nurse station, clean utility, soiled utility, nourishment, medication, stretcher storage and housekeeping rooms shall be provided consistent with Section 2.1.H.

12. Staff toilet facilities shall be provided convenient to the area.

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 or patient acuity.

2.1.D (Not Used)

2.1.E Renovation means any change of walls or partitions within an existing building to create a new architectural configuration or 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.

2.1.F Equipment Installation

1. 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 (13 cm) clearance between the floor and the equipment.

2. 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.

3. 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 (0.8 mm); or if exposed to seepage (or contamination), the equipment shall be sealed to the adjoining equipment or adjacent walls or ceilings.

2.1.G *(Not Used)* ~~Infection Control Risk Assessment is the assessment carried out by a multidisciplinary group designated to determine the number of rooms required to prevent and control communicable disease or protect severely immunosuppressed patients in the facility. Numbers of air-borne infection isolation rooms or need for a protected environment are based on prevalence of communicable disease in the community and the health systems' patient population and programs~~.

(See *Section 5.1.A for Infection Control requirements and* Table 2A and footnotes for ventilation requirements for isolation rooms.)

2.1.H Service Areas

The services listed below shall be provided in each nursing unit. 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 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 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 is 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.

1. Administrative center or nurse station

   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. Toilet room(s) conveniently located for staff use (may be unisex). A staff toilet room shall be provided on each nursing floor. *Staff toilet rooms may be shared between departments and/or nursing units.*

3. 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. Coats may be stored in closets or cabinets on each floor or in a central staff locker area.

4. Multipurpose room(s) for staff, patients, patients' families for patient conferences, reports, education, training sessions, and consultation. ~~These rooms must be accessible to each nursing unit.~~ *These rooms shall be convenient to each nursing unit and clinical department.* They 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 2.1.H21.*

5. Examination/treatment room(s). Such rooms may be omitted if all patient rooms in the nursing unit are single-bed rooms. Centrally located examination and treatment room(s) may serve more than one nursing unit. They may be

located on other floors if convenient for regular use. Such rooms shall have a minimum clear floor area of 120 square feet (11.2 square meters). *The minimum clear floor area for examination/treatment rooms used exclusively for outpatients may be reduced to 100 square feet.*

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

7. Soiled workroom or soiled holding room.

   a. This room shall be separate from the clean workroom. The soiled workroom shall contain a clinical sink. The room shall have a work counter and space for separate covered containers for soiled linen and waste. Additional rooms used only for temporary holding of soiled material may omit the clinical sink and work counter.

   b. In the soiled work room where decontamination and gross clean-up procedures take place, in addition to work sink, a handwashing sink shall be provided. The operational narrative in conjunction with Infection Control Risk Assessment shall describe the frequency and extent of decontamination procedures to determine the needs for the handwashing sink or the alcohol-based hand sanitizer. The work sink in the soiled work room shall provide a two-compartment sink with drain boards. A flushing rim clinical sink must also be available for disposal of liquid wastes.

8. 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. ~~and adequate lighting to easily identify drugs.~~

9. Clean linen storage. Each nursing unit shall contain a designated area for clean linen storage. This may be within the clean workroom, a separate closet, or an approved distribution system on each floor.

10. 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.

11. Ice machine. Each nursing unit shall have equipment to provide ice for treatments and nourishment. Ice-making equipment may be in the clean work room/holding room or at the nourishment station. Ice intended for human consumption shall be from self-dispensing ice makers.

12. Equipment storage room. Appropriate room(s) shall be provided for storage of equipment necessary for patient care and as required by the operational narrative. This room may serve more than one unit on the same floor.

13. Storage space for stretchers and wheelchairs shall be provided in a strategic location, without restricting normal traffic.

14. 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.*

15. Patient toilet room(s), in addition to those serving bed areas, shall be conveniently located to multipurpose room(s). Patient toilet rooms may be unisex. Patient toilet rooms serving multipurpose rooms may also be designated for public use.

16. 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.

17. Housekeeping room. A housekeeping room shall be provided convenient to each nursing unit or departmental unit. It shall be directly accessible from the unit and may serve more than one unit on a floor. It shall contain a service sink or floor receptor and provisions for all routinely used supplies and housekeeping equipment.

18. Dictation. An area with a work surface separate from the nurse station shall be provided.

19. Nurse or supervisor office(s).

20. Charting function consistent with the operational narrative. ~~Charting facilities shall not obstruct corridors.~~ *Wall charting/storage units shall be permanently mounted, self-closing, and extend no more than 3.5 inches into the corridor when closed. Charting units shall be provided with artificial illumination as per Table*

12.

21. Staff lounge facilities shall be provided. These facilities may be on another floor.

22. Bathtubs or showers shall be provided at a ratio of one facility for each 12 chemical dependency or psychiatric beds 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.

23. A minimum of 15 s.f. of day/dining floor space per licensed long term acute care bed shall be provided for day/dining activities. Windows shall be provided consistent with section 7.28.A10.

2.1.I Surgical Recovery Units

1. 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. 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.

2.1.J Nursing Unit means 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.

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

2.1.L 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.

2.1.M *Picture Archiving and Communication System (PACS) is an electronic means for acquiring, storing, transmitting, and viewing images are 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)

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. ~~These water lines~~ *The water service lines shall be fed from a looped municipal system*, ~~shall be~~ 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. An approved well can be an acceptable secondary source of water. 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 for 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.

~~For PROPOSED facilities, approved by the department means:~~

~~1. A wastewater stabilization lagoon or an approved "package" treatment plant with the effluent discharging to the surface or ground waters of the State, which complies with the following:~~

~~a. Designed consistent with the "Recommended Standards for Wastewater Facilities" adopted by the Great Lakes-Upper Mississippi River Board of State and Provincial, Public Health and Environmental Managers, 1997 edition;~~

~~b. Has received a "discharge permit" from the Michigan Department of Environmental Quality.~~

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

For PROPOSED facilities, approved by the department means:

1. A wastewater stabilization lagoon or an approved package treatment plant with the effluent discharging to the surface or ground waters of the State, which complies with the following:

a. Designed consistent with the "Recommended Standards for Wastewater Facilities" adopted by the Great Lakes-Upper Mississippi River Board of State and Provincial, Public Health and Environmental Managers, 1997 edition;

b. Has received a discharge permit from the Michigan Department of Environmental Quality.

3.2 Facility Site Design

3.2.A Roads

Paved roads shall be provided within the property for access to all entrances and to loading and unloading docks (for delivery trucks). Hospitals with an organized emergency service shall have the emergency access well marked to facilitate entry from the public roads or streets serving the site. Other vehicular or pedestrian traffic 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.

3.2.B (Not Used)

3.3 Environmental Pollution Control

3.3.A (Not Used)

3.3.B (Not Used)

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.

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 Nonmedical)

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

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

b. Fixed nonmedical equipment includes, but is not limited to, items such as walk-in refrigerators, kitchen cooking equipment, serving lines, conveyors, mainframe computers, laundry, and similar equipment.

4.2.C Movable Equipment (Medical and Nonmedical)

4.2.C1 Movable equipment includes items that require floor space or electrical and/or mechanical connections but are portable, such as wheeled items, portable items, office-type furnishings, and 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 nonmedical 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 nonmedical) that is customarily installed by the manufacturer or vendor. Since major technical equipment may require special structural designs, electromechanical requirements, or other considerations, close coordination between owner, building designer, installer, construction contractors, and others is required.

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*

~~*Special consideration*~~ *Evaluation shall be* ~~*given*~~ *made to protecting computerized equipment such as multiphasic laboratory testing units, as well as computers, from power* ~~*surges and spikes*~~ *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.*

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 injuries, or loss of vital electronic medical records

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, and protection of patients during construction.

5.1 Planning and Design

~~Continual facility upgrades through renovation and new construction of health care facilities can create conditions which can be hazardous to patients. Control for clean to dirty airflow, interruption of utility and/or building/equipment services, and communication requirements shall be specified in the project bid documents in order to ensure construction specification compliance. Any temporary relocation of services during construction shall be described in the operational narrative.~~

~~Design and planning for such projects in the health care facilities shall require consultation from infection control professionals and safety personnel. Early involvement in the conceptual phase will help ascertain the risk assessment for susceptible patient location and disruption of essential patient services.~~

5.1.A Infection Control

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

The ICRA shall be conducted by a panel with expertise in infection control, risk management, facility design, construction and construction phasing, 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 ICRA shall address, but not be limited to, the following:

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), patients who are severely immunosuppressed, (e.g., bone marrow transplant recipients) or both.

5.1.A.1 *Design. Building design features shall be addressed when developing the ICRA.*

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

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

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

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

e. Finishes and surfaces.

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.A.2 *Construction. Building and site areas anticipated to be affected by construction shall be addressed when developing the ICRA.*

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

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

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

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

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

f. Location of known hazards.

5.1.A3 *Infection control risk mitigation protocols shall be prepared by the ICRA panel*

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

a. Patient placement and relocation.

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

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

d. Protection from demolition

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

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

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

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 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 will include assurance for clean to dirty airflow, emergency procedures, criteria for interruption of services, construction of roof surfaces, written notification of interruptions, and communication authority. Noise and vibration will affect patients and procedures and shall be planned for accordingly. The renovation areas shall be isolated from the occupied areas during construction using airtight barriers which meet the requirements of the Office of Fire Safety. 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. All such precautions shall be described in the operational narrative.

5.3 Commissioning

5.3.A.1 *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.*

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

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 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.

5.3.A.2 *Construction or renovation of a health care facility, or any phase of which, that involves patient care shall not be occupied prior to the Michigan Department of*

Community Health conducting an opening survey and issuing occupancy approval.

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.

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.

Documentation of existing conditions should include:

1) *Subsurface conditions (including soil testing reports, soil types, known water table information, active/abandoned utility locations)*
2) *Foundation and superstructure information, including the structure/equipment's (elevator) ability to handle the movement of heavy/large loads from one location to another.*
3) *Fire suppression, detection, and alarm systems and construction type and if 100% sprinklered.*
4) *Various communications systems (including telephone, nurse call, overhead paging, telemetry, dictation, electronic imaging)*
5) *Various plumbing systems (including domestic water, hydronics, treated water, wastewater, pneumatic tube, pneumatic controls, medical gases/vacuum)*
6) *Air Balance Reports*
    a. *Existing airflow of affected areas.*
7) *Main Electrical Service and electrical service affected by construction*
    a. *Rating*
    b. *Actual Load (Peak) and Feeder Sizes as applicable*
    c. *Power factor*
8) *Emergency Power System*
    a. *Rating*
        - *Life Safety Branch*
        - *Emergency / Critical Branch*
        - *Equipment Branch*
    b. *Actual Load (Peak) and Feeder Sizes as applicable*
        - *Life Safety Branch*
        - *Emergency / Critical Branch*
        - *Equipment Branch*

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 plan.*

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

1. *As-built drawings that include civil, structural, architectural, mechanical, electrical, and plumbing trades.*
2. *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 MDCH.

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 on any single weekday shift. 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)

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.

7.2.A2 In new construction, 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 MDCH 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.

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.

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)

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, and the door shall swing outward or be double-acting*, unless a 30 inch by 48 inch clear floor area is provided beyond the door swing into the toilet room*.

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 2.1.H.

7.2.C Airborne Infection Isolation Room(s)

Refer to section 7.31D and Table 2A for ventilation requirements. If UV lights are used, the minimum ceiling height should be 9 feet.

The airborne infection isolation room requirements contained in these Guidelines for particular service areas throughout a facility should be predicated on an "infection control risk assessment" and based on the needs of specific community and patient populations served by an individual organization. The number of airborne infection isolation rooms for individual patient units should be determined based upon an "infection control risk assessment" or by a multidisciplinary group designated for that purpose. This process ensures a more accurate determination of environmentally safe and appropriate room types and spatial needs. It is suggested that reference be made to the Center for Disease Control and Prevention (CDC) *publications: (www.cdc.gov)*

1) "Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities" ~~as they appear in the Federal Register dated October 28, 1994 and the Morbidity and Mortality Weekly Report (MMWR) 1994; 43 (No. RR-13),~~ *See http://www.cdc.gov/nchstp/tb.*

2) "Guidelines for Preventing *Health-Care-Associated* ~~Nosocomial~~ 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* ~~" published by CDC in the American Journal of Infection Control (22:247-292).~~

3) "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/ncicod/hip/enviro/guide.htm

Other useful references include ~~the~~ 1) ASHRAE Standard 62-1989R "Ventilation for

acceptable Indoor Air Quality" and ~~the~~ 2) MiOSHA "Occupational Health Program Directive No. 96-9 Enforcement Policy And Procedures For Occupational Exposure To Tuberculosis." See http://www.michigan.gov/documents/cis_wsh_cet5810_90205_7.doc

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 ~~floors, and~~ perimeter walls, ~~above and below the~~ 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.

An exception may be allowed for sliding doors in ICUs where a separate ante-room 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) ~~(Not Used)~~

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 with 99.97 percent efficiency for particles >3 micron (µm) in size. 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 concluded 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.*

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.*

General Space and staffing requirements are critical for bone marrow transplant facilities. Patients in these units may be acutely aware of the surrounding environment, which is their life support system during the many weeks when they will be confined in an immunosuppressed condition. Means of controlling unnecessary noise are important. At times, each patient may require individual privacy, although each is required to be under close staff supervision. Bone marrow transplant rooms should be located so as to have access within the hospital to out-of-unit diagnostic and treatment equipment, particularly radiation therapy equipment. All bone marrow transplant-designated beds should be in exceptionally clean environments, which should consist of protective environment rooms equipped with HEPA filtration, preferably located in close proximity to each other. A countertop with scrub sink and space for high-level disinfection procedures should be available outside the entrance to each patient room when located within the nursing unit or at each entrance to a dedicated bone marrow transplant room. A handwashing station should be accessible near the entrance to each patient room within a dedicated bone marrow transplant unit.

Patients should be housed in single-bedded rooms with full-height partitions, sealed airtight to the structure to prevent cross-infections. All surfaces, floors, walls, ceilings, doors, windows, and curtains should be scrubbable.

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

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. 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

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.

~~In renovation projects, clerestory windows with window sills above the heights of adjacent ceilings may be used, provided they afford patients a view of the exterior and are equipped with appropriate forms of glare and sun control. Distance from the patient bed to the outside window shall not exceed 50 feet (15.2 meters).~~ 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 Sections 2.1.H.1., 3, 6, 7, 8, 9, 10, 11, 12 and 16, except that the equipment storage room shall not serve other nursing units or departments.

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 ~~Each unit shall be designed to provide visual contact between patient beds so that there can be constant visual contact between the nurse and the patient.~~
(Not Used)

Intensive Care patients should be ~~visually~~ observed at all times. This can be ~~achieved~~ *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.* ~~If a central station is chosen, it should be geographically located to allow for complete visual control of all patient beds in the critical care unit. It should be designed to maximize efficiency in traffic patterns. Patients should be oriented so that they can see the nurse but cannot see the other patients. There should be an ability to communicate with the clerical staff without having to enter the central station. If a central station is not chosen, the unit should be designed to provide visual contact between patient beds so that there can be constant visual contact between the nurse and patient~~

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 for a separate bathtub or shower.

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 2.1.H2., 4, 13, and 17, 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.

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 separate room ~~with acoustical privacy~~.

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 be located in private rooms or cubicles.

7.3.D Pediatric Critical Care (Not Used)

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 ~~have a clearly identified entrance and reception area for families~~ 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. ~~A scrub area shall be provided at each public entrance to the patient care area(s) of the NICU.~~

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)

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 ~~100~~ *120* square feet *of clear floor area per bassinet* excluding sinks and aisles. There shall be an aisle ~~for circulation~~ adjacent to each ~~patient~~ *infant* care space with a minimum width of ~~3~~ *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 ~~16~~ *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)

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 a sink, 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 Sections 2.1.H1., 2, 3, 4, 6, 7, 8, 9, 12, 16, 18, 19, and 20.

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. Housekeeping Room(s)

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 nonrelated 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 ~~public areas,~~ 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 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 (91 cm) 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.

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

7.4.E A separate room shall be provided 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 A soiled workroom or soiled holding room shall be provided consistent with the requirements of Section 2.1.H7.

7.4.G ~~Housekeeping Room~~ *(Not Used)*

~~A housekeeping room consistent with the requirements of Section 2.1.H17. shall be provided for the exclusive use of the nursery suite.~~

7.4.H Provisions for cleaning of bassinets and other equipment shall be made. This function shall be in a separate room on the unit or at a remote location, such as central sterile processing.

7.5 Pediatric and Adolescent Unit

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(c).

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 2.1.H5. shall be provided.

7.5.F The service areas in the pediatric and adolescent nursing units shall conform to Section 2.1.H. and shall also meet the following standards.

7.5.F. 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 nonambulatory 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.

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

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 2.1.H. 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.A.

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. Provisions shall be made for storage of soap, towels, and other supplies within these facilities.*

7.6.B6 A separate charting area shall be provided with provisions for acoustical privacy.

A viewing window to permit observation of patient areas by the charting nurse or physician may be used if the arrangement is such that patient files cannot be read from outside the charting space.

7.6.B7 At least two separate social spaces, one appropriate for noisy activities and one for quiet activities, shall be provided. The combined area shall be at least 40 square feet 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 for 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. (i.e., 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 (1.39 square meters) 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) contain less than 16 beds, the occupational therapy functions may be performed within the noisy activities area, if at least an additional 10 square feet (0.93 square meter) 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.*

7.7 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). 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. X-ray film illuminators for handling at least four films simultaneously *or PACS* shall also be provided.

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 MDCH 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.

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 MDCH may grant approval to deviate from this requirement. 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)* ~~Room(s) for surgical cystoscopic and other endo-urologic procedures. This room shall have a minimum clear area of 350 square feet (32.52 square meters), with a minimum clear dimension of 15 feet (4.57 meters) exclusive of fixed or wall-mounted cabinets and built-in shelves. X-ray viewing capability to accommodate at least four films simultaneously shall be provided.~~

~~In renovation projects, rooms for surgical cystoscopy may have a minimum clear area of 250 square feet (23.28 square meters).~~

Note: This section has 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 ***Endoscopy*** ~~Endoscopy suite requirements (See Section 9.9.)~~

Procedures involving known or suspected cases of airborne infectious disease shall be performed in a room meeting airborne infection isolation ventilation requirements or in a space using local exhaust ventilation, in accordance with the "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities."

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

Each procedure room shall have a minimum clear area of 200 square feet) exclusive of any fixed cabinets or built-in shelves that allows for a minimum 3 foot clearance on all sides of the patient table or stretcher. Procedure rooms shall include clean supply storage facilities, workcounter, and handwashing facilities as per section 2.1.A. Floor covering and perimeter bases shall be monolithic and joint-free. A system for staff emergency communication shall be provided consistent with the requirements of Section 7.32.G4.

Dedicated processing room(s), accessible to a corridor, shall be provided for cleaning and disinfecting of instrumentation. At a minimum each decontamination 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.

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

7.7.A6 (Not Used)

7.7.A7 The surgical suite shall be located and arranged to prevent nonrelated 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. These areas shall comply with the requirements of 2.1.C.

7.7.B2 Post-Anesthetic Care Units (PACUs)

Each PACU shall meet the requirements of patient holding areas in 2.1.C. At least one door to the Phase I recovery room shall access directly from the surgical suite without crossing public hospital corridors. *Provisions to comply with sections 2.1.H6 and 2.1.H7 shall be made within or immediately adjoining the PACU.*

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 2.1.H *parts 1, 2, ~~3,~~ 4, 6, 7, 8, 9, ~~10,~~ 11, 12, 13, 16, 17, and 20.* Additional requirements include:

7.7.C1 (Not Used)

7.7.C2 (Not Used)

7.7.C3 *Flash Sterilization*

~~A sterilizing facility(ies) with high-speed sterilizer(s) or other sterilizing equipment for immediate or emergency use shall be grouped to several operating rooms for convenient, efficient use. A work space and handwashing facility shall be included.~~ *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.*

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 Scrub Facilities

Two scrub positions shall be provided near the entrance to each operating room. Two scrub positions may serve two operating rooms if both 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. ~~Scrub sinks shall be located outside the clean core.~~

~~In new construction, view windows at scrub stations permitting observation of room interiors should be provided.~~

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

7.7.C7 (Not Used)

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 ~~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.~~ *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 ~~(Not Used)~~ *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 arranged ~~to provide a one-way traffic pattern~~ so that personnel enter from outside the surgical suite, change, and move directly into the surgical suite.

7.7.C12 *A* 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 suite and to provide convenient access to the recovery room.~~ *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 2.1.C.

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. ~~It shall be located in an enclosed room which is accessible both from the restricted corridor of the surgical suite and from a general corridor of the facility.~~

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 See *Chapter 9* ~~Section 9.5.~~ of this document concerning the separate outpatient surgical unit.

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.

7.8.A2 Postpartum Unit

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

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

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.

(2) (Not Used)

(3) (Not Used)

(4) (Not Used)

(5) (Not Used)

(6) (Not Used)

b. Service areas for this unit shall be provided consistent with the requirements of Section 2.1.H. 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.* ~~When bathing facilities are not provided in patient rooms, there shall be at least one shower and/or bathtub for each 6 beds or fraction thereof, consistent with the requirements of Section 2.1.H14.~~

(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* ~~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.

7.8.A3 Caesarean/Delivery Suite

a. Caesarean/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 2.1.H5* 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 rooms may be substituted.)

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

e. Recovery Room(s) (LDR/LDRPs may be substituted.)

Recovery areas (shall comply with the requirements of Section 2.1.C.) 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 2.1.H. 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 caesarean/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 caesarean/delivery rooms for convenient, efficient use consistent with the operational narrative. A work space and handwashing facility shall be included.

(4) Scrub facilities. Two scrub positions shall be provided near the entrance to each caesarean/delivery room(s). Two scrub positions may serve two caesarean/delivery rooms, if both are located adjacent to the entrance of each caesarean/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 ~~to provide a one-way traffic pattern~~ 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.

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

7.9 Emergency Service

7.9.A ~~Definition~~

~~Levels of emergency care range from initial emergency management to definitive emergency care. For classification of emergency departments/services/trauma centers, see Appendix 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.A1. (Not Used)~~

~~*7.9.A2.~~ *(Not Used)*

7.9.B ~~General~~ (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.

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~~, triage,~~ 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 2.1.H5., 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

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. As a minimum, these spaces shall include those defined by Sections 2.1.H1., 3, 6, 7, 17, and 21.

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.

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.

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.

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 2.1.H5., 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 (7.43 square meters) per patient cubicle.

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, ~~X-ray film illuminators~~, 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.

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, ~~X-ray film illuminators~~, 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 2.1.H5., 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.D10 Scrub stations shall be located adjacent to each trauma room.

7.9.D11 ~~(Not Used)~~ *For routine patient decontamination needs the hospital shall provide decontamination facilities that minimally includes the following building elements:*

1. *An outside entrance and internal door to a corridor of the emergency department.*
2. *All sanitary waste (sink, floor drains) shall discharge to a dedicated holding tank.*
3. *A negative air environment, exhausted at least 25 feet from exterior doors, operable windows, or domestic air intakes.*
4. *A hand held showerhead with temperature controls.*
5. *The decontamination area ceiling, wall, and floor finishes shall be smooth, monolithic, nonporous, non-adsorptive, and scrubbable, (capable of withstanding cleaning with and exposure to harsh chemicals.) Floor finishes shall be non-slip.*

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 Sections 2.1.H., 1, 2, 3, 6, 7, 17, and 21.

~~Disposal space for regulated medical waste, e.g., gauzes/linens soaked with body fluids, should be separate from routine disposal space.~~ *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 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 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

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 Cath Lab, Nuclear Medicine, Radiotherapy, PET, etc.)

7.10.A General

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

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, ~~C.T. Scanner~~ and similar procedure rooms.

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 2.1.C.

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 7.2). 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.*

See discussion of PACS in 2.1.M.

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)* ~~A dose administration area shall be provided for Positron Emission Tomography (PET). It shall be located near the preparation area.~~

e. *(Not Used)* A ~~hypothermia room shall be provided for the radiotherapy suite.~~

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 2.1.H5.

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 2.1.C.

7.10.B12 Service areas consistent with Sections 2.1.H6., 7, 8 and 17 shall be provided.

7.10.B13 (Not Used)

7.10.B14 (Not Used)

7.10.B15 ~~Space shall be provided for Magnetic Resonance Imaging services for the storage of cryogenic gases.~~ *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 2.1.C that are conveniently located to the unit.

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 activity, and 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 Reserved

7.12 Laboratory

~~The following physical facilities shall be provided within the hospital as defined in the operational narrative.~~ *Clinical laboratory facilities shall be provided consistent with the scope of services detailed in the operational narrative.*

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.

~~Provisions should be made for the following procedures to be performed on-site: blood counts, urinalysis, blood glucose, electrolytes, blood urea and nitrogen (BUN), coagulation, and transfusions (type and cross-match capability).~~

~~Provisions should also be included for specimen collection and processing.~~

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.

~~For example, separate facilities should be provided for such incompatible materials as acids and bases, and vented storage should be provided for volatile solvents. Such facilities should conform to applicable NFPA standards.~~

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

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

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

3. 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, including emergency shower and eyeflushing devices, shall be provided in the work areas.

7.12.G (Not Used)

~~Facilities and equipment for terminal sterilization of contaminated specimens should be provided consistent with the operational narrative and the Medical Waste Regulatory Act of 1990.~~

7.12.H (Not Used)

~~If radioactive materials are employed, facilities should be available for long-term storage and disposal of these materials. No special provisions will normally be required for body waste products from most patients receiving low level isotope diagnostic material. Requirements of authorities having jurisdiction should be verified.~~

7.12.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 2.1.H3., 12, 13, 15, and 17, 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 (6.51 square meters) 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

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)

The unit should comply with the guidelines of the Association for Advancement of Medical Instrumentation (AAMI) and the requirements of the Center for Medicare and Medicaid Services (CMS).

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. Where the hospital determines that a dedicated unit is desirable for acute dialysis, the requirements of Section 7.14. shall apply. For chronic outpatient ESRD treatment, the requirements of Section 7.14. shall apply.

7.14.A1 (Not Used)

7.14.A2 (Not Used)

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)

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 utility.

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 ~~Individual patient treatment areas shall contain at least 80 square feet (7.44 square meters) for chairs and 100 square feet (9.3 square meters) for beds/stretchers. There shall be at least a 4-foot (1.22 meters) space between beds, stretchers and/or lounge chairs, with a minimum of 4 feet (1.2 meters) at the foot of each bed, stretcher, or lounge chair.~~
A minimum of 100 square feet of clear floor area shall be provided per bed/stretcher 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 2.1.H ~~6., 7, 8, 9, 10, 13, 17, and 21.~~ *and the operational narrative.*

7.14.B8 *(Not Used)* ~~If home training is provided in the unit, a private treatment area of at least 120 square feet (11.15 square meters) shall be provided for patients who are being trained to use dialysis equipment at home. This room shall contain a counter and a separate drain for fluid disposal.~~

7.14.B9 *(Not Used)* ~~Examination/treatment room(s) shall have a minimum clear floor area of 120 square feet (11.2 square meters). They may be combined with the home training room.~~

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 ~~deep service~~ *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 ~~(Not Used)~~ *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 ~~(Not Used)~~ *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, ~~showers~~, water closets, handwashing facilities, and space for donning scrub attire.

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.

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.

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 2.1.H2., 3, 12, and 15.

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.

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

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.

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.

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 nonhydroscopic 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.*

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 Sate 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 Food Service Sanitation Regulations of the State of Michigan, which consist of:~~

~~1. the Public Health Code, Act 368, P.A. of 1978, Part 129, as amended~~

~~2. the 1976 edition of the USPHS Model Food Service Sanitation Ordinance, and~~

~~3. Food Service Sanitation Rules promulgated under the authority of Section 12909 of the Public Health Code~~

Michigan Food Law 2000, P.A. 92 of 2000, MCL 289.1101 et seg.; Chapters 4, 5, 6, & 7 of the Food Code.

~~Food service facilities and equipment should conform with these standards, the National Sanitation Foundation, Michigan Food Law and other appropriate codes, Facilities and should provide food service for staff, visitors, inpatients, and outpatients, as may be appropriate.~~

~~Consideration may also be required for meals to VIP suites, and for cafeterias for staff, ambulatory patients, and visitors, as well as providing for nourishments and snacks between scheduled meal service.~~

~~Patient food preparation areas should be located in an area adjacent to delivery, interior transportation, storage, etc.~~

~~Finishes in the dietary facility should be selected to ensure cleanability and the maintenance of sanitary conditions.~~

~~A7.18.B.~~ ~~Functional Elements~~

~~If on-site conventional food service preparation is used, the following in size and number appropriate for approved function should be provided.~~

Provide an area 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.) ~~Food storage components should be grouped for convenient access from receiving and to the food preparation areas. All food should be stored clear of the floor. Lowest shelf should be not less than 12 inches (30 cm) 6 inches (15 cm) above the floor or should be closed in and sealed tight for ease of cleaning.~~

~~A7.18.B3~~. ~~Cleaning supplies storage. Provide a separate storage room for the storage of non-food items, such as cleaning supplies, that might contaminate edibles.~~

~~A7.18.B4.~~ ~~Additional storage rooms. They should be provided as necessary for the storage of cooking wares, extra trays, flatware, plastic and paper products, and portable equipment.~~

~~A7.18.B5.~~ ~~Food preparation work spaces. Provide work spaces for food preparation, cooking,~~

and baking. These areas should be as close as possible to the user (i.e., tray assembly and dining). Provide additional spaces for thawing and portioning.

A7.18.B6. Assembly and distribution. Provide a patient tray assembly area and locate within close proximity to the food preparation and distribution areas.

A7.18.B7. Food service carts. 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.

A7.18.B8. Dining area. Provide dining space(s) for ambulatory patients, staff, and visitors. These spaces should be separate from the food preparation and distribution areas.

A7.18.B9. Vending services. If vending devices are used for unscheduled meals, provide a separate room that can be accessed without having to enter the main dining area. The vending room should contain coin-operated machines, bill changers, a handwashing fixture, and a sitting area. Facilities for the servicing and sanitizing of the machines should be provided as part of the food service program of the facility.

A7.18.B10. Area for receiving, scraping, and sorting soiled tableware should be adjacent to ware washing and separate from food preparation areas.

A7.18.B11. Ware washing facilities.

They should be designed to prevent contamination of clean wares with soiled wares through cross-traffic. The clean wares should be transferred for storage or use in the dining area without having to pass through food preparation areas.

A7.18.B12. Pot washing facilities, including multi-compartmented sinks of adequate size for intended use, should be provided convenient to using service. Supplemental heat for hot water to clean pots and pans may be by booster heater or by steam jet.

Mobil carts or other provisions should be made for drying and storage of pots and pans.

A7.18.B13. Waste storage room

A food waste storage room should be conveniently located to the food preparation and ware washing areas, but not within the food preparation area. It should have direct access to the hospital's waste collection and disposal facilities.

A7.18.B14. Handwashing

Fixtures that are operable without the use of hands should be located conveniently accessible at locations throughout the unit.

Offices for the use of the food service manager should be provided. In smaller facilities, this space may be located in an area that is part of the food preparation area.

A7.18.B16. Toilets and locker spaces

~~Spaces should be provided for the exclusive use of the dietary staff. They should not open directly into the food preparation areas, but must be in close proximity to them.~~

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. ~~Where hot water or steam is used for general cleaning, additional space within the room should be provided for the storage of hoses and nozzles.~~

Ice making equipment

It 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).

~~**A7.18.B19.** Commissary or contract services from other areas~~

~~Items above may be reduced as appropriate. Provide for protection of food delivered to insure freshness, retention of hot and cold, and avoidance of contamination. If delivery is from outside sources, provide protection against weather. Provisions must be made for thorough cleaning and sanitizing of equipment to avoid mix of soiled and clean.~~

~~**A7.18.C.** Equipment~~

~~Mechanical devices should be heavy-duty, suitable for use intended, and easily cleaned. Where equipment is movable provide heavy-duty locking casters. If equipment is to have fixed utility connections, the equipment should not be equipped with casters. Walk-in coolers, refrigerators, and freezers should be insulated at floor, as well as at walls and top. Coolers and refrigerators should be capable of maintaining a temperature down to freezing. Freezers should be capable of maintaining a temperature of 20 degrees below 0 F. Coolers, refrigerators, and freezers should be thermostatically controlled to maintain desired temperature settings in increments of 2 degrees or less. Interior temperatures should be indicated digitally so as to be visible from the exterior. Controls should include audible and visible high and low temperature alarm. Time of alarm should be automatically recorded.~~

~~Walk-in units may be lockable from outside but must have release mechanism for exit from inside at all times. Interior should be lighted. All shelving should be corrosion resistant, easily cleaned, and constructed and anchored to support a loading of at least 100 pounds per linear foot.~~

~~All cooking equipment should be equipped with automatic shut-off devices to prevent excessive heat build-up.~~

~~Under-counter conduits, piping, and drains should be arranged to not interfere with cleaning of floor below or of the equipment.~~

~~**A7.18.D.** Plumbing~~

~~Provide removable stainless steel mesh in addition to grilled drain cover to prevent entry~~

~~of large particles of waste, which might cause stoppages. No plumbing lines may be exposed overhead or on walls where possible accumulation of dust or soil may create a cleaning problem or where leaks would create a potential for food contamination.~~

~~All handwash facilities should be usable without need to interrupt any services.~~

~~**A7.18.E.** Hoods and Venting Equipment~~

~~Hoods and venting equipment should meet the requirements of NFPA 96.~~

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 ~~be functionally separated from all other areas of the department. Workspace shall be provided to handle the cleaning and decontamination of all medical/surgical instruments and equipment.~~ *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 heat-sensitive equipment (ETO sterilizer and ETO aerators). This room is used exclusively for the inspection, assembly, and packaging of medical/surgical supplies and equipment for sterilization. Area 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.*

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 to 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 2.1.H.6.*

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 2.1.H17. 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

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 ~~(Not Used)~~ *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 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 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 the first story 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.

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)

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*.

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/or emergency showers meeting the design specifications of the American National Standards Institute ANSI Z358.1-1990 shall be provided in all areas where ~~materials which are corrosive, caustic, or otherwise~~ injurious *or corrosive materials* are handled.

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 have 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.

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.

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 suites, 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.

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.A3 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 nonslip 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.

Aesthetic considerations related to stains and odor control support recommendations to avoid carpeting in areas of frequent spillage or heavy soilage (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, *endoscopy procedure rooms*, and any 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 for caesarean sections, 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, including exposed structure, shall be cleanable with routine housekeeping equipment.

In operating rooms, delivery rooms for caesarean sections, isolation rooms, *film processing rooms, bronchoscopy rooms,* and sterile processing rooms, provide ceilings that are smooth and free of fissures, open joints, or crevices and minimize retention or passage of dirt particles. In psychiatric patient rooms, toilets, and seclusion rooms, ceiling construction shall be monolithic to inhibit possible escape or suicide. Ceiling-mounted air and lighting devices shall be security type. Ceiling-mounted fire prevention sprinkler heads shall be of the 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.

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)

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 ~~In the absence of an engineered traffic study, T~~*T*he following ~~guidelines for~~ number of elevators shall *be provided* ~~apply~~:

a. At least two elevators shall be installed when ~~1 to 200~~ patient beds are located on floors other than the main entrance floor, or where the major inpatient services are located on a floor other than those containing patient beds.

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.

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)* ~~Elevators shall be equipped with a two-way automatic level-maintaining device with an accuracy of ± 1/4 inch (± 0.64 cm).~~

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)* ~~Elevator call buttons and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door edge safety devices and shall be interconnected with a system of smoke detectors.~~

7.30.B6 *(Not Used)* ~~Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this section, as well as all applicable safety regulations and codes.~~

7.30.C Waste Processing Services

~~7.30.C1. Storage and Disposal~~

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

~~*7.30.C2. Medical Waste~~

~~Medical waste shall be disposed of either by incineration or other approved technologies. Incinerators or other~~ major disposal equipment may be shared by two or more institutions.

~~a. Incinerators or other major disposal equipment may also be used to dispose of other medical waste where local regulations permit. Equipment shall be designed for the actual quantity and type of waste to be destroyed and shall meet all applicable regulations.~~

~~b. Incinerators with fifty pounds per hour or greater capacities shall be in a separate room or outdoors; those with lesser capacities may be located in a separate area within the facility boiler room. Rooms and areas containing incinerators shall have adequate space and facilities for incinerator charging and cleaning, as well as necessary clearances for work and maintenance. Provisions shall be made for operation, temporary storage, and disposal of materials so that odors and fumes do not drift back into occupied areas. Existing approved incinerator installations, which are not in separate rooms or outdoors, may remain unchanged provided they meet the above criteria.~~

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

~~*d. Heat recovery~~

~~*e. Environmental guidelines~~

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.

Nuclear Waste Disposal. See Code of Federal Regulations, Title X, Parts 20 and 35, concerning the handling and disposal of nuclear materials in health care facilities.

7.31 Mechanical Standards

7.31.A General

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

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.

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)

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

7.31.A4 ~~(Not Used)~~ *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.*

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)

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)

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.

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)

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)

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.

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 ~~shall~~ *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.

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 standby 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.*

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.

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.*

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 shall be located at least 25 feet (7.62 meters) from exhaust outlets of ventilating systems, combustion equipment stacks, medical-surgical vacuum systems, plumbing vents, or areas that may collect vehicular exhaust or other noxious fumes. Plumbing vents that terminate at a level above the top of the air intake may be located as close as 10 feet (3.05 meters). *Relief air is exempt from the 25 foot separation requirement.* The bottom of outdoor air intakes serving central systems shall be as high as practical, but at least 6 feet (1.83 meters) above ground level, or, if installed above the roof, 3 feet (91 cm) 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.

Prevailing winds and/or proximity to other structures may require greater clearances. Note that a 25-foot 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.

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.

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).

7.31.D5 (Not Used)

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.*

~~See ACGIH Industrial Ventilation: A Manual of Recommended Practice for additional information. Acceptable concentrations of anesthetizing agents are unknown at this time. The absence of specific data makes it difficult to set specific standards. However, any scavenging system should be designed to remove as much of the gas as possible from the room environment. It is assumed that anesthetizing equipment will be selected and maintained to minimize leakage and contamination of room air.~~ *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 o 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 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 75 percent or more including hoods requiring HEPA filters meeting the hot DOP test.

7.31.D9 If duct 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.

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)

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 ~~(Not Used)~~ *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 ~~meet the~~ *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.

~~e. New facilities and remodeled facilities shall conform to American National Standard for Laboratory Ventilation, ANSI/AIHA Z9.5, latest issue. (AIHA - American Industrial Hygiene Association).~~

~~f. New laboratory fume hoods must be certified to have passed the ASHRAE 110 test, latest issue.~~

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. Fume hoods and their associated equipment in the air stream intended for use with perchloric acid and other strong oxidants, shall be constructed of stainless steel or other material consistent with special exposures and shall be provided with a water wash and drain system to permit periodic flushing of duct and hood consistent with NFPA 45. When perchloric acid or other strong oxidants are only transferred from one container to another, standard laboratory fume hoods and the associated equipment may be used in lieu of stainless steel construction.~~

b. In new construction and major renovation work, each hood used to process infectious or radioactive materials shall have a minimum average face velocity of 100 fpm with no point under 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.

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)* ~~Exhaust hoods in food preparation centers shall comply with the requirements of the Description of Ventilation Systems - Food Service Establishments pursuant to Rule R325.26001 of the Michigan Administrative Code.~~

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 Complied Laws. ~~Administrative Code,~~.* ~~Refer to Title 29 Code of Federal Regulations Part 1910.1047.~~

b. All source areas shall be exhausted, including the sterilizer equipment room, service/aeration areas, over the sterilizer door, and the aerator. If the ETO cylinders are not located in a well-ventilated, unoccupied equipment space, an exhaust hood shall be provided over the cylinders. The relief valve shall be terminated in a well-ventilated, unoccupied equipment space, or outside the building. If the floor drain which the sterilizer(s) discharges to is not located in a well-ventilated, unoccupied equipment space, an exhaust drain cap shall be provided (coordinate with local codes).

c. Ensure that general airflow is away from sterilizer operator(s).

d. 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.

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 ~~50~~*125* cfm, and the space should be under negative pressure and at least ~~0.001~~*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 cleanable or replaceable filters. The filters shall have a minimum efficiency of 25 percent based on ASHRAE 52.1-92 atmospheric dust spot efficiency. These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air handling system with the proper filtration, as noted in Table 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 at 99.97 percent efficiency for a 0.3 µm sized particle in the supply airstream. These interrupting filters protect patient rooms from maintenance-derived release of environmental microbes from the ventilation system components. Recirculation HEPA filters can be used to increase the equivalent room air exchanges. Constant volume airflow is required for consistent ventilation for the protected environment. If the facility determines that airborne infection isolation is necessary for protective environment patients, an anteroom 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 The infectious disease isolation room described in these guidelines is to be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. The design of airborne infection isolation (AII) rooms should include the provision for normal patient care during periods not requiring isolation precautions. Supplemental recirculating devices may be used in the patient room, to increase the equivalent room air exchanges; however, such recirculating devices do not provide the outside air requirements. Air may be recirculated within individual isolation rooms if HEPA filters are used. Rooms with reversible airflow provisions for the purpose of switching between protective environment and AII functions are not acceptable.

7.31.D28 Critical Environments such as airborne infectious isolation rooms and operating rooms shall have a minimum differential pressure of 0.01 in wc AND minimum differential air flow of 125 cfm. The exhaust from the toilet room serving these rooms may be credited towards this differential.

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 Mycobacteriu8m 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)* ~~The following standards shall apply to plumbing fixtures:~~

~~a. The material used for plumbing fixtures shall be nonabsorptive and acid resistant.~~

~~b. Water spigots used in lavatories and sinks shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc., consistent with the requirements of Section 2.1.A.~~

~~c. (Not Used)~~

~~d. Clinical sinks shall have an integral trap wherein the upper portion of the water trap provides a visible seal.~~

~~e. Showers and tubs shall have nonslip walking surfaces.~~

7.31.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. ~~Backflow prevention devices shall be installed on hose bibbs, supply nozzles used for connection of hoses or tubing, and at other locations where the potable water supply must be protected from contamination.~~ *The potable water supply shall be designed, installed and maintained to prevent contamination from nonpotable 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 for bathing fixtures and handwash lavatories shall be appropriate for comfortable use but shall not exceed 120^0F (see Table 4).

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.

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

a. *(Not Used)*

b. *(Not Used)*

c. (Not Used)

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.

Floor drains in cystoscopy operating rooms have been shown to disseminate a heavily contaminated spray during flushing. Unless flushed regularly with large amounts of fluid, the trap tends to dry out and permit passage of gases, vapors odors, insects and vermin directly into the operating room. For new construction, if 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).

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.)

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 ~~comply~~ *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.)

7.31.E6 Clinical vacuum system installations shall be ~~consistent~~ *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 All required alarms shall sound at a location which is staffed 24-hours per day.

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 shall conduct and submit to the owner and local authority having jurisdiction, the following studies in accordance with the 1996 International Electrical Testing Association Guidelines: 6.4 Short Circuit Study, 6.5 Equipment Evaluation Study and 6.6 Protective Device Coordination Study.

7.32.A3 (Not Used)

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 the appropriate IEEE and ANSI standards.

7.32.A4 (Not Used)

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.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, ~~away from traffic lanes,~~ and located in dry, ventilated spaces free of corrosive or explosive fumes, gases, or any flammable material. Overload protective devices shall operate properly in ambient room temperatures.

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.

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 12.

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.. ~~At least one night light fixture in each patient room shall be controlled at the room entrance.~~ Lighting for coronary and intensive care bed areas shall permit staff *to observe* ~~observation of~~ the patient while minimizing *disturbances to the patient* ~~glare~~.

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's use. This light shall be controlled by a local switch in the room at the entrance from the corridor.

The intent of the night light is primarily for the patient use at night without having to turn on an excessive amount of light. The local switch feature provides the patient with an option to turn out the light if they find the light to be undesirable.

The switch location near the door also allows staff to use the light for night observation into the room and limit the disruption to the patient.

The designer may also wish to consider installation of a night light within the toilet room in addition to the patient room night light.

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)

Light intensity for staff and patient needs should generally comply with health care guidelines set forth in the IES publication. Consideration should be given to controlling intensity and/or wavelength to prevent harm to the patient's eyes (i.e., retina damage to premature infants and cataracts due to ultraviolet light). 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)

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*~~, and trauma~~ rooms *consistent with table 12*.

7.32.D9 (Not Used)

~~7.32.D10 Light fixtures shall be equipped with lenses or shields for protection of the lamps or with lamps which will not shatter.~~ *(Not Used)*

7.32.D11 *Exterior building signage and entrance lights for the Emergency Department must be on emergency power.*

7.32.D12 *Battery back-up lighting shall be installed in emergency power generator areas, emergency power transfer switch areas and other areas required by NFPA 101 and NFPA 70.*

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*

The required lumen 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 were not considered anesthetizing locations by the committee.

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

7.32.E Receptacles

7.32.E1 ~~Each operating and delivery room shall contain, at a minimum, sixteen single or eight duplex outlet receptacles at the head of the table and eight single, four duplex or combination thereof, receptacles throughout the rest of the room. Where mobile X-ray, laser, or other equipment with special electrical plug configurations is used, additional receptacles distinctively marked for X-ray or laser use shall be provided. The receptacles shall have the standardized NEMA configuration, as determined by the operating and/or delivery room staff. Combinations of these configurations shall be permitted where more than onestandard configuration is used. The circuiting of these receptacles shall comply with the NFPA 70 with respect to connections to the Normal and Essential Electrical Systems.~~ *Electrical convenience receptacles shall be provided in accordance with Table 13*

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

7.32.E2 ~~Each patient room shall have duplex receptacles. There shall be one at each side of the head of each bed, one for the television, if used, and one on each other wall.~~ Receptacles may be omitted from exterior walls where construction or room configuration makes installation impractical. ~~Nurseries shall have at least two duplex receptacles for each bassinet. Critical care areas as defined by NFPA 99 and NFPA 70,~~

~~including pediatric and newborn intensive care units, shall have at least seven duplex outlets at the head of each bed, crib, or bassinet. Trauma and resuscitation rooms shall have eight duplex outlets located convenient to the head of each bed. Emergency department examination and treatment rooms shall have a minimum of six duplex outlets located convenient to the head of each bed. At least 50 percent of critical care and emergency care outlets shall be connected to emergency system power and be so labeled. Each general care examination and treatment table and each work table shall have access to two duplex receptacles.~~

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 purposes of powering the bed. Additionally, there should be not less than one receptacle on each wall located 18" above the finished floor. ~~Additional receptacles required for dedicated television outlets or other such "resident" equipment should not be counted as being one of these receptacles. Where existing construction or design makes the placement of these receptacles impractical, they may be omitted through the approval of the authority having jurisdiction.~~

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 (Not Used)

7.32.F Equipment

7.32.F1 (Not Used)

7.32.F2 (Not Used)

7.32.F3 *(Not Used)* ~~X-ray film illuminators for displaying at least four films simultaneously in each operating room and at least two films simultaneously in specified emergency treatment rooms, and the X-ray viewing room of the radiology department shall be installed. All illuminator units within one space or room shall have lighting of uniform intensity and color value.~~

7.32.F4 (Not Used)

7.32.F5 (Not Used)

7.32.F6 (Not Used)

Special equipment is identified in the following sections: Critical Care Units, Newborn Nurseries, Pediatric and Adolescent Unit, Psychiatric Nursing Unit, Surgical Suites, Obstetrical Suite, Emergency Service, Imaging Suite, Nuclear Medicine, Laboratory Suite, Rehabilitation Therapy Department, Renal Dialysis Unit, Respiratory Therapy Service, Morgue, Pharmacy, Dietary Facilities, Administration and Public Areas, Medical Records, Central Services, General Stores, and Linen Services. These sections should be consulted to ensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

7.32.F7 (Not Used)

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 ~~Nurses Calling System~~ *Hospital Signaling and Nurse Call Equipment*

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

1. *Patient Station*
2. *Bath Station*
3. *Emergency Signal Station (Staff Assistance)*
4. *Code Call Station (Code Blue)*

These stations are defined and described in UL 1069.

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.

7.32.G1 In patient areas, each patient room shall be served by at least one ~~calling~~ *Patient* Station for two-way voice communication. Each bed shall be provided with a call device. Two call devices serving adjacent beds may be served by one ~~calling~~ *Patient S*tation. Calls shall activate a visible signal *per Table 14. The Patient Station will have a call assurance lamp, which lights when a call is placed, and reset switch for canceling a call.* ~~in the corridor at the patient's door, in the clean work. room, in the soiled work room, medication, charting, clean linen storage, nourishment, equipment storage, and examination/treatment room(s) and at the nursing station of the nursing unit. In multi-corridor nursing units, additional visible signals shall be installed at corridor intersections.~~ In rooms containing two or more *Patient S*tations, indicating lights shall be provided at each station. ~~Nurses calling systems at~~ *Each Patient* ~~calling~~ station shall be equipped with an indicating light which remains lighted as long as the voice circuit is operating. *Duty Stations to receive these calls shall be provided as noted in Table 14.*

7.32.G2 ~~A nurses emergency call~~ *A Bath S*tation shall be provided at each patient water closet, bathtub, sitz bath, and shower stall *that can be activated by a pull cord that is* ~~A nurses emergency call shall be~~ accessible to a collapsed patient lying on the floor.

~~Inclusion of a pull cord will satisfy this standard.~~ *An alarm in these areas can only be turned off at the Bath Station where it was initiated. Duty Stations to receive these calls shall be provided as noted in Table 14.*

~~The emergency call shall be designed so that a signal activated at a patients calling station will initiate a visible and audible signal distinct from the regular nurse calling system that can be turned off only at the patient calling station. The signal shall activate an annunciator panel at the nurse station, a visible signal in the corridor at the patient's door, and at other areas defined by the operational narrative. Provisions for emergency calls will also be needed in outpatient and treatment areas where patients may be subject to incapacitation. In areas such as critical care, recovery and pre-op, the bedside nurses call station shall activate a signal readily seen at the control station.~~

7.32.G3 *(Not Used)* ~~In areas such as critical care, recovery and pre-op, the bedside nurses call station shall activate a signal readily seen at the control station.~~

7.32.G4 ~~An~~ *Emergency Signal Stations* ~~assistance system for staff~~ to summon additional staff assistance and shall be provided *as shown in Table 14. Duty Stations to receive these calls shall be provided per the Operational Narrative*. ~~in each operating, delivery, recovery, emergency examination and/or treatment area, and in critical care units, nurseries, special procedure rooms, cardiac catheterization rooms, stress-test areas, triage, out-patient surgery, admission and discharge areas, diagnostic/treatment areas, and areas for psychiatric patients, including seclusion rooms, anterooms and toilet rooms serving them, communal toilet and bathing facility rooms, dining, activity, therapy, exam, and treatment rooms. This system shall annunciate visually and audibly in the clean work room, in the soiled work room, medication, charting, clean linen storage, nourishment, equipment storage, and examination/treatment room(s), if provided, and at the nursing station of the nursing unit with back-up to another staffed area from which assistance can be summoned.~~

Staff assistance is typically local and the situation is usually not life-threatening to the patient.

7.32.G5 ~~In critical care units, recovery and pre-op the call system shall include provisions for an emergency code resuscitation alarm~~ *There shall be Code Call Stations (commonly referred to as a "Code Blue")* to summon assistance from outside the unit *as shown in Table 14. There shall be a 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.*

This is a life-threatening situation for the patient. 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. There must be an assurance that 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 (Not Used)

7.32.G8 (Not Used)

7.32.G9 (Not Used)

Alternate technologies can be considered for emergency or nurse call systems. If radio *paging* ~~frequency~~ 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.

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

1. *All pharmaceutical hoods, laboratory hoods, hot labs where xenon 133 is stored, radio pharmacies, heating plant and accessories consistent with NFPA 99 and the Michigan Electrical Code, medical gas/vacuum systems, patient telemetry systems, physiological monitoring systems, and nurse call systems, crash cart locations, central equipment for patient clinical information systems, automated medication dispensing systems, medication and laboratory refrigeration equipment, organ and tissue refrigeration equipment, ethylene oxide sterilizer ventilation systems, cryogenic venting systems, medical gas alarms, ventilation of all operating rooms, cooling for 10% but not less than one of each operating room, delivery room, trauma rooms, angiography rooms, interventional radiology rooms and cardiac catheterization labs, ventilation for intensive care rooms and special care nurseries.*

2. *At least one C.T. scanner, one radiographic/fluoroscopic imaging unit. This requirement includes the cooling for the electronic equipment that supports the procedure rooms*

3. *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.*

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.

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 shall be installed in accordance with NFPA 99;

Consider providing emergency power 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:

1. 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.

2. 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.

3. 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.

4. 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.

To enable facilities to continue with complex and/or emergency procedures in the surgical suite, a minimum of 10 percent of the operating rooms should be served by an HVAC system which is connected to emergency power.

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 be installed in accordance with NFPA 99; 4-4.2.1.7

7.32.I (Not Used)

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
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 Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
SURGERY AND CRITICAL CARE					
Operating/surgical cystoscopic rooms[9]	***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
Treatment room [10]	--	--	6	--	--
Trauma room[10]	Out	3	15	--	No
Anesthesia gas storage	In	--	8	Yes	--
Endoscopy [18]	~~In~~ ***OUT***	2	6	--	No
Bronchoscopy [18]	~~In~~ ***IN***	2	12	Yes	No
Cardiac Catheterization/Angiography [16]	***OUT***	*3*	*15*	--	*No*
Waiting Room [19]	*In*	*2*	*12*	*Yes*	--
Triage [19]	*In*	*2*	*12*	*Yes*	--
Patient Decontamination Room	***IN***	*2*	*12*	*Yes*	*No*
NURSING					

Table 2A (Continued)
Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
Patient room	--	2	2	--	--
Toilet room	In	--	10	Yes	--
Newborn nursery	Out	2	6	--	No
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	--	--
Patient corridor	--	--	2	--	--
ANCILLARY					
~~Radiology~~ *Imaging*					
~~X-ray (surgical/critical care and catheterization)~~	~~Out~~	~~3~~	~~15~~	~~--~~	~~No~~
X-ray (diagnostic & treatment) *17*	--	--	6	--	--
Darkroom	In	--	10	Yes	No
Nuclear medicine (Note: RELOCATED)	~~In~~ --	2	6	~~Yes~~ --	~~No~~ --
Nuclear medicine Hot Lab	*In*	*2*	*10*	*Yes*	*No*

Table 2A (Continued)
Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	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	~~6~~ *10*	Yes	No
Glass washing	In	2	10	Yes	--
Microbiology[13]	In	2	~~6~~ *10*	Yes	No
~~Nuclear medicine~~ (*Note: RELOCATED ABOVE)*	~~In~~	~~2~~	~~6~~	~~Yes~~	~~No~~
Pathology	In	2	~~6~~ *10*	Yes	No
Serology	Out	2	6	--	No
Sterilizing	In	2	10	Yes	--
Endoscopy Scope Reprocessing Room	*In*	--	*10*	*Yes*	*No*
Dialyzer Reprocessing Room	*In*	--	*10*	*Yes*	*No*
Bulk Xenon 133 Storage, Dispensing, Admin.	*In*	--	*10*	*Yes*	*No*
Autopsy room	***IN***	--	12	Yes	No
Non-refrigerated body-holding room	In	--	10	Yes	--
Pharmacy (General) / (sterile compounding areas)	Out***/OUT***	2	4	--	--

Table 2A (Continued)
Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
DIAGNOSTIC AND TREATMENT					
Examination room	--	--	6	--	--
Medication room	Out	--	4	--	--
Treatment room	--	--	6	--	--
Physical therapy and hydrotherapy	In	--	6	--	--
Soiled workroom or soiled holding	In	--	10	Yes	No
Clean workroom or clean holding	Out	--	4	--	--
ETO-sterilizer room	***IN***	--	10	Yes	No
Sterilizer *mechanical* equipment room	In	--	10	Yes	--
Central medical surgical supply					
Soiled or decontamination room	In	--	10	Yes	No
Clean workroom	***OUT***	--	4	--	No
Sterile Storage	***OUT***	--	4	--	--
Hazardous Waste Storage	*In*	--	*10*	*Yes*	*No*
SERVICE					
Food preparation center[14]	--	--	10	--	No
Warewashing[15]	In	--	10	Yes	No

Table 2A (Continued)
Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
Dietary ~~day~~ storage	~~In~~ --	--	2	--	--
Laundry, general	--	--	10	Yes	No
Soiled linen (sorting and storage)	In	--	10	Yes	No
Clean linen storage	Out	--	2	--	--
Soiled linen and trash chute room	In	--	10	Yes	No
Bedpan room	In	--	10	Yes	No
Bathroom	In	--	10	Yes	No
Janitor's closet	In	--	10	Yes	No

Table 2B

Temperature and Humidity Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Relative humidity[7] (%)	Design temperature[8] (degrees F)
SURGERY AND CRITICAL CARE		
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
~~*Central Medical and Surgical Supply*~~	~~*30-60*~~	~~*70-75*~~
NOTE: PROPOSED ITEM ABOVE (ADDED AT MEETING #4) WAS DROPPED AT MEETING #5		

Notes:

[1]The ventilation rates in this table cover ventilation for comfort, as well as for asepsis and odor control in areas of acute care hospitals that directly affect patient care and are determined based on healthcare facilities being predominantly "No Smoking" facilities. Where smoking may be allowed, ventilation rates will need adjustment. Areas where specific ventilation rates are not given in the table shall be ventilated in accordance with ASHRAE Standard 62~~-1989~~ *1999*, ~~*Ventilation for Acceptable Indoor Air Quality*~~, and ASHRAE ~~*Handbook of Applications.*~~ *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

Table 2B (Continued)
Temperature and Humidity Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

ventilation provisions for air quality control as may be appropriate. OSHA standards and/or NIOSH criteria require special ventilation requirements for employee health and safety within healthcare facilities.

[2]*Rooms 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. 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.

[3]To 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.

[4]Number of air changes may be reduced when the room is unoccupied if provisions are made to ensure that the number of air changes indicated is reestablished any time the space is being utilized. Adjustments shall include provisions so that the direction of air movement shall remain the same when the number of air changes is reduced. Areas not indicated as having continuous directional control may have ventilation systems shut down when space is unoccupied and ventilation is not otherwise needed, ~~if the maximum infiltration or exfiltration permitted in Note 2 is not exceeded and if adjacent pressure balancing relationships are not compromised.~~

[5]Air from areas with contamination and/or odor problems shall be exhausted to the outside and not recirculated to other areas. Note that individual circumstances may require special consideration for air exhaust to the outside, e.g., in intensive care units in which patients with pulmonary infection are treated, and rooms for burn patients.

*[6]Recirculating room HVAC units refers to those local units that are used primarily for heating and cooling of air, and not disinfection of air. Because of cleaning difficulty and potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." However, for airborne infection control, air may be recirculated within individual isolation rooms if HEPA filters are used. Isolation and intensive care unit rooms may be ventilated by reheat induction units in which only the primary air supplied from a central system passes through the reheat unit. Gravity-type heating or cooling units, such as radiators or convectors shall not be used in operating rooms, *intensive care, special care nurseries, PACU, angiography, interventional radiology, and cardiac catheterization labs*. ~~and other special care areas~~. See Appendix A for a 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.

Table 2B (Continued)
Temperature and Humidity Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

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

[8]Where temperature ranges are indicated, the systems shall be capable of maintaining the rooms at any point within the range. A single figure indicates a heating or cooling capacity of at least the indicated temperature. This is usually applicable 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.

[9]National Institute for Occupational Safety and Health (NIOSH) Criteria Documents regarding Occupational Exposure to Waste Anesthetic Gases and Vapors, and Control of Occupational Exposure to Nitrous Oxide indicate a need for both local exhaust (scavenging) systems and general ventilation of the areas in which the respective gases are utilized.

[10]The term *trauma room* as used here is the operating room space in the emergency department or other trauma reception area that is used for emergency surgery. The first aid room and/or "emergency room" used for initial treatment of accident victims may be ventilated as noted for the "treatment room." Treatment rooms used for Bronchoscopy shall be treated as Bronchoscopy rooms. Treatment rooms used for cryosurgery procedures with nitrous oxide shall contain provisions for exhausting waste gases.

[11]The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., Aspergillus spores). These special ventilation areas shall be designed to provide directed airflow from the cleanest patient care area to less clean areas. These rooms shall be protected with HEPA filters at 99.97 percent efficiency for a 0.3 μm sized particle in the supply airstream. These interrupting filters protect patient rooms from maintenance-derived release of environmental microbes from the ventilation system components. Recirculation HEPA filters can be used to increase the equivalent room air exchanges. Constant volume airflow is required for consistent ventilation for the protected environment. If the facility determines that airborne infection isolation is necessary for protective environment patients, an anteroom should be provided. Rooms with reversible airflow provisions for the purpose of switching between protective environment and airborne infection isolation functions are not acceptable.

[12]The 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.

[13]When 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).

[14]Food preparation centers shall have ventilation systems whose air supply mechanisms are interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit

Table 2B (Continued)
Temperature and Humidity Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

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.

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

[16]*The 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.*

[17]*The 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.*

[18]*To 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. ~~Scope reprocessing rooms shall be ventilated as per soiled workroom requirements.~~*

[19]*Required 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 (%)	Filter bed no. 2 (%)
All areas for inpatient care, treatment, and diagnosis, and those areas providing direct service or clean supplies such as sterile and clean processing, etc.	2	30	90
Protective environment room	2	30	99.97
Laboratories	1	80	--
Administrative, bulk storage, soiled holding areas, food preparation areas, *chemical dependency units, psychiatric unites, outpatient dialysis units,* and laundries	1	30	--

Notes:

Additional roughing or prefilters should be considered to reduce maintenance required for filters with efficiency higher than 75 percent. The filtration efficiency ratings are based on dust spot efficiency per ASHRAE ~~52-92.~~ *Standard 52.1-1992 -- Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter and 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.52.1 versus ASHRAE Std.52.1, Dust Spot Efficiency:

MERV 17	*99.97%*
MERV 16	*95%*
MERV 14-15	*90-95%*
MERV 12-14	*80-90%*
MERV 10-11	*60-70%*
MERV 9-10	*50-60%*
MERV 8	*40-50%*
MERV 6-7	*25-30%*
MERV 6	*20-30%*
MERV 5	*<20%*

Table 4

Hot Water Design

	Clinical	Dietary[1]	Laundry
Gallons per hour per bed*	3	2	2
Temperature (^{o}F)**	120	~~140~~ ***120***	160**

[1] Provisions shall be made to provide 180 ^{o}F rinse water at warewasher in accordance with the manufacturer's recommendations and as approved by the authority having jurisdiction. (May be by 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 nearly that of the source tank and the cold water used for tempering is relatively warm.

** Provisions shall be made to provide 160 ^{o}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, and formula of soap and bleach as well as type and degree of soil. Lower temperatures may be adequate for most procedures in many facilities but the higher 160 ^{o}F should be available when needed for special conditions.

Table 5

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

~~Section~~	Location	Oxygen	Vacuum	Med. Air
~~7.2.A.~~	***Inpatient bed*** ~~Patient Rooms~~ (Medical and Surgical) [1]	1 ~~(one outlet accessible to each bed)~~	1 ~~(one outlet) accessible to each bed)~~	--
~~7.2.B10.~~	***Inpatient*** Examination/Treatment ***locations*** [1] ~~(~~Including diagnostic and therapeutic radiology ~~Medical, Surgical, and Postpartum Care)~~	1	1	--
~~7.2.C./7.2.D.~~	~~Isolation (Infectious and Protective) (Medical and Surgical)~~	~~1~~	~~1~~	--
~~7.2.E.~~	~~Seclusion Room (Medical, Surgical, and Postpartum)~~	~~1~~	~~1~~	--
~~7.3.A.~~	Critical Care (General)	2	3	1
~~7.3.A14.~~	~~Isolation (Critical)~~	~~2~~	~~3~~	~~1~~
~~7.3.B.~~	Coronary Critical Care	2	2	1
~~7.3.E.~~	Newborn Intensive Care	3	3	3
~~7.4.B.~~	Newborn Nursery (Full-Term) [2]	1	1	1
	Special Care Nursery	***1***	***1***	***1***
~~7.5.A.~~	Pediatric and Adolescent	1	1	1

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

~~Section~~	Location	Oxygen	Vacuum	Med. Air
~~7.6.A.~~	Psychiatric Patient Rooms	--	--	--
~~7.6.D.~~	Seclusion Treatment Room	--	--	--
	Pre-procedure inpatient holding	***1***	***1***	***1***
~~7.7.A1.~~	~~General~~ Operating Room	2	3	1
~~7.7.A2.~~	~~Cardio, Ortho, Neurological~~	~~2~~	~~3~~	~~1~~
~~7.7.A3.~~	~~Orthopedic Surgery~~	~~2~~	~~3~~	~~1~~
~~7.7.A4.~~	~~Surgical Cysto and Endo~~	~~1~~	~~3~~	~~--~~
	Non-surgical Endoscopy	***1***	***2***	***1***
~~7.7.B2.~~	Post-Anesthetic Care Unit	1	3	~~--~~ ***1***
~~7.7.C9.~~	Anesthesia Workroom	1 per workstation	--	1 per workstation
~~7.7.C14.~~	Outpatient Recovery	1	1	--
~~7.8.B2.~~	Postpartum Bedroom	1	1	--
~~7.8.A3.~~	Caesarean/Delivery Room	2	3	1

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

~~Section~~	Location	Oxygen	Vacuum	Med. Air
~~7.8.A3.d.~~	Labor Room	1	1	1
~~7.8.A3.e.~~	Recovery Room	1	3	--
~~7.8.A4.~~	Labor/Delivery/Recovery (LDR)	2	2	1
~~7.8.A4.~~	Labor/Delivery/Recovery/Postpartum (LDRP)	2	2	1
~~7.9.C2.~~	Initial Emergency Management per bed	1	1	--
~~7.9.D3.~~	Triage Area (Definitive Emergency Care)	1	1	1
~~7.9.D7.~~	Definitive Emergency Care Exam/Treatment Rooms	1	1	1
~~7.9.D8.~~	Trauma/Cardiac***/Resuscitation & associated imaging*** Room(s)	2	3	1
~~7.9.D9.~~	Orthopedic and Cast Room	1	1	--
~~7.10.H.~~	Cardiac Catheterization***/Angiography & Interventional Radiology*** Lab	~~1~~ ***2***	2	2
~~7.16.A2.~~	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 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:
- Subacute care facilities 8.7.
- Alzheimer's and other dementia units 8.8.
- Dialysis Services 8.33.

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 Site

See Section 3.1.

8.1.E Paved roads shall be provided within the property for access to all entrances and to loading and unloading docks (for delivery trucks). 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.)

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

8.1.I Renovation

See Section 1.2.

8.1.J Provisions for Disasters

See Section 1.4.

8.1.K Codes and Standards

See Section 1.5.

8.1.L (Not Used)

8.1.M Equipment

See Chapter 4.

8.1.N Construction

See Chapter 5.

8.1.O Record Drawings and Manuals

See Chapter 6.

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.

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.

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. ~~They may be omitted from single-bed or two-bed rooms when such is located in an adjoining toilet room serving that room only.~~ *The handwashing facility may be omitted from a toilet room when that toilet room is shared between two private bedrooms that each contain a handwashing facility.*

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,, *unless a 30 inch by 48 inch clear floor area is provided beyond the door swing into the toilet room*.

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 (Not Used)

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.

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.

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.C The services listed below shall be provided in each nursing unit. These services shall be in or readily available to each resident module.

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.

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 2.1.H2., 3, 6, 7, 8, 9, 10 ~~and~~ 12, *and 15.*

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)

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*

The space needed for dining and recreation should be determined by considering (a) needs of residents to use adaptive equipment and mobility aids and receive assistance from support and service staff, and (b) 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 in one or more individual weatherproof buildings on-site.

8.4 Activities (Not Used)

If required by the operational narrative, include space for files, records, computers, and administrative activities, a storage space for supplies and equipment, and a quiet space for residents to maximize conversations. This quiet space may be incorporated within space for administrative activities. : 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 which 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 2.1.H17.

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:

8.5.B1 Convenient facility access usable by the disabled

8.5.B2 Lockers for storing patients' clothing and personal effects
8.5.B3 Outpatient facilities for dressing

8.5.B4 (Not Used)

8.6 Personal Services (Barber/Beauty) Areas

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

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

8.7 ~~Subacute Care Facilities~~ *Chronic Ventilator Dependent Care Unit*

The following shall be provided:

a. Staff support facilities, justified by the operational narrative, shall be provided consistent with the requirements of Section 2.1H parts 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 20. These facilities may be shared with other units as appropriate.
b. Emergency-powered overbed lights at each resident bed.
c. A minimum of two emergency powered electrical duplex receptacles shall be provided at each resident bed.
d. 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.
e. Ventilator alarms shall initiate a visual and audible signal in the corridor directly outside of the resident bedroom.
f. Provisions shall be made for audible alarms to the nurse stations and other staffed locations for the ventilators.

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 shall rooms be used that don't meet these standards for room size or layout.

8.8 Alzheimer's and Other Dementia Units (Not Used)

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

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.

Activity space for resident use in dementia programs should be provided.

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.

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 (Not Used)

8.11 Linen services

Shall be provided consistent with the requirements of Section 7.23.

8.12 Housekeeping Rooms

Housekeeping rooms consistent with the requirements of Section 2.1.H17. shall be provided. There shall be at least one housekeeping room for each floor.

8.13 Engineering service and equipment areas

Engineering service and equipment areas consistent with the requirements of Section 7.27. shall be provided.

8.14 General Standards for Details and Finishes

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.

8.14.A2 See Sections 7.28.A6. and 7.28.A8.

8.14.A3 See Section 7.28.A9.

8.14.A4 Resident rooms or suites and day/dining/activity rooms shall have windows consistent with the requirements of Section 7.28.A10.

8.14.A5 (Not Used)

8.14.A6 See Section 7.28.A13.

8.14.A7 See Section 7.28.A14.

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.*

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 ~~(Not Used)~~ *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.

8.14.A14 See Section 7.28.A22.

8.14.A15 See Section 7.28.A25.

8.15 Finishes

8.15.A (Not Used)

8.15.B (Not Used)

8.15.C See Section 7.28.B4.

8.15.D (Not Used)

8.15.E See Section 7.28.B6.

8.15.F See Section 7.28.B7.

8.15.G The finishes of all exposed ceilings and ceiling structures in resident rooms and staff work areas shall be readily cleanable with routine housekeeping equipment. Finished ceilings shall be provided in all resident bedrooms and care areas where dust fallout might create a problem.

8.15.H (Not Used)

8.16 Reserved

8.17 Reserved

8.18 Reserved

8.19 Reserved

8.20 Reserved

8.21 Reserved

8.22 Reserved

8.23 Reserved

8.24 Reserved

8.25 Reserved

8.26 Reserved

8.27 Reserved

8.28 Reserved

8.29 Reserved

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).

a. Engineered traffic studies are recommended. In the absence of an engineered traffic study, the ~~following guidelines for~~ number of elevators shall *comply with the following* ~~apply~~:

i. 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 (1.53 meters) wide by 7 feet 6 inches (2.29 meters) deep. Car doors shall have a clear opening of not less than 3 feet 8 inches (1-12 meters).

ii. When 60 to 200 residents are housed on floors other than the main entrance floor, at least two elevators consistent with Section 8.30.B1.a.i shall be installed.

iii. When 201 to 350 residents are housed on floors other than main entrance floor, at least three elevators, consistent with Section B.30.B1.a.i shall be installed.

iv. 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.

v. When the nursing facility is part of a general hospital, elevators may be shared, and the standards of Section 7.30. shall apply.

vi. 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.B3**. See Section 7.30.B3.~~

8.30.C Waste Processing Service - See Section 7.30.C.

8.31 Mechanical Standards

8.31.A 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.A1 The HVAC systems shall be designed 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.

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

8.31.C ~~Steam and hot water systems consistent with the requirements of Section 7.31.C. shall be provided.~~ *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. The heating system shall be capable of maintaining 72 F (measured 3 feet above the floor) in a portion of the building sufficient to house all residents for a minimum of 4 hours in the event of loss of electrical service to the facility. This portion of the building shall accommodate the various needs of the resident population and allow for safe exiting.*

~~Steam and~~ *Domestic* hot water systems consistent with the requirements of Section 7.31.C. shall be provided.

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.

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 (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. (Horizontal runs of ducts serving range hoods should be kept to a minimum.)

8.31.D2 See 7.31.D2.

8.31.D3 See 7.31.D3.

8.31.D4 (Not Used)

8.31.D5 Filter efficiencies shall be tested consistent with ASHRAE 52.1-92. 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 75 percent or more.

8.31.D6 See Section 7.31.D10.

8.31.D7 ~~(Not Used)~~ *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 cleanable or replaceable filters. The filters shall have a minimum efficiency of 25 percent based on ASHRAE 52.1-92 atmospheric dust spot efficiency. These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air handling system with the proper filtration, as noted in Table 7.

8.31.D9 See 7.31.D20.

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 See. 7.31.E1.

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. ~~Backflow preventers (vacuum breakers) shall be installed on hose bibbs and supply nozzles used for connection of hoses or tubing in and at other locations where the potable water supply must be protected from contamination.~~ *The potable water supply shall be designed, installed and maintained to prevent contamination from nonpotable 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.

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.

8.32 Electrical Standards

8.32.A General

8.32.A1 See Section 7.32.A1.

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 12 *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 which will not shatter.

The reader should refer to the IES Lighting Handbook and Lighting for Health Care Facilities for additional information. Excessive differences in illumination levels within the same range of sight should be avoided as aging eye 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) should be avoided. 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 NFPA 70.

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 room from which the call has been placed.

Alternate technologies can be considered for emergency or nurse call systems subject

to the approval by the authority having jurisdiction.

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, and either a visual signal in the corridor at the resident's door or other appropriate location, or a staff pager indicating the calling resident's name and/or room location, and at other areas defined by the 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.

8.32.H Emergency Electrical Service

8.32.H1 As a minimum, nursing facilities or sections thereof shall have emergency electrical systems, as required in NFPA 101, ~~and~~ Chapter 16 of NFPA 99, *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.* Emergency electrical service shall be capable of providing not less than 4 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.

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.

8.32.H3 An emergency electrical source shall provide lighting and/or power during an interruption of the normal electric supply. Where stored fuel is required, storage capacity shall permit continuous operation for at least 24 hours. Fuel storage for electricity generation shall be separate from heating fuels.

8.32.H4 Local codes and regulations may have additional requirements.

8.32.H5 Exhaust systems (including locations, mufflers, and vibration isolators) for internal combustion engines shall be designed and installed to minimize objectionable noise and odors.

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 Facilities[1]

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 Room	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	In	2	6	--	--
Occupational therapy	In	2	6	--	--
Soiled workroom or soiled holding	In	2	10	Yes	No
Clean workroom or clean holding	Out	2	4	--	--
Medication room	Out	2	4	--	--
Sterilizer exhaust room	In	--	10	Yes	No
Linen and trash chute room if provided	In	--	10	Yes	No

Table 6A (Continued)
Ventilation of Certain Areas of Nursing Facilities[1]

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, general, if provided	--	2	10	Yes	No
Soiled linen sorting and storage	In	--	10	Yes	No
Clean linen storage	Out	--	2	~~Yes~~ --	No
Food preparation facilities[10]	--	2	10	--	No
Dietary warewashing	In	--	10	Yes	No
Dietary storage areas	--	--	2	Yes	No
Housekeeping rooms	In	--	10	Yes	No
Bathing rooms	In	--	10	Yes	No

Table 6B

Temperature and Humidity of Certain Areas of Nursing Facilities[1]

Function Area	Relative humidity[7] (%)	Design Temperature[8] (degrees F)
Resident room[13]	[9]	71-81
Resident unit corridor	[9]	--
Toilet Room	--	75
Airborne infectious isolation rooms, if provided	--	71-81
Isolation alcoves or anterooms, if provided[9]	--	--
Dining rooms[13]	--	75
Activity rooms, if provided[13]	--	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[12]	--	80
Dietary warewashing	--	--
Dietary storage areas	--	--
Housekeeping rooms	--	--
Bathing rooms	--	75

Table 6B (Continued)
Temperature and Humidity of Certain Areas of Nursing Facilities[1]

***Notes*:**

[1]The ventilation rates in this table cover ventilation for comfort, as well as for asepsis and odor control in areas of nursing facilities that directly affect resident care and are determined based on nursing facilities being predominantly "No Smoking" facilities. Where smoking may be allowed, ventilation rates will need adjustments. Areas where specific ventilation rates are not given in the table shall be ventilated in accordance with ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality,* and ASHRAE *Handbook of Applications.* OSHA standards and/or NIOSH criteria require special ventilation requirements for employee health and safety within nursing facilities.

[2]Design of the ventilation system shall 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.

[3]To 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.

[4]Number of air changes may be reduced when the room is unoccupied if provisions are made to ensure that the number of air changes indicated is reestablished any time the space is being utilized. Adjustments shall include provisions so that the direction of air movement shall remain the same when the number of air changes is reduced. Areas not indicated as having continuous directional control may have ventilation systems shut down when space is unoccupied and ventilation is not otherwise needed.

[5]Air from areas with contamination and/or odor problems shall be exhausted to the outside and not recirculated to other areas. Note that individual circumstances may require special consideration for air exhaust to outside.

[6]Because of cleaning difficulty and potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." Isolation rooms may be ventilated by reheat induction units in which only the primary air supplied from a central system passes through the reheat unit. Gravity-type heating or cooling units such as radiators or convectors shall not be used in special care areas.

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

[8]Where temperature ranges are indicated, the systems shall be capable of maintaining the rooms at any point within the range. A single figure indicates a heating or cooling capacity of at least the indicated temperature. This is usually applicable where residents may be undressed and require a warmer environment. Nothing in these 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.

[*9]The 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

Table 6B (Continued)
Temperature and Humidity of Certain Areas of Nursing Facilities[1]

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.

[*10]Food preparation facilities shall have ventilation systems whose air supply mechanisms are interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit corridors does not compromise the exit corridor restrictions of NFPA 90A, the pressure requirements of NFPA 96, or the maximum defined in the table. The number of air changes may be reduced or varied to any extent required for odor control when the space is not in use.

[11]*Nursing 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…"*

Table 7

Filter Efficiencies for Central Ventilation and Air Conditioning Systems in Nursing Facilities

Area Designation	Minimum number of filter beds	Filter efficiencies (%) Filter bed no. 1	Filter efficiencies (%) Filter bed no. 2
All areas for inpatient care, treatment, and/or diagnosis, and those areas providing direct service or clean supplies	2	30	80
Administrative, bulk storage, soiled holding, laundries, food preparation areas	1	30	

Note: The filtration efficiency ratings are based on dust spot efficiency per ASHRAE ~~52-92.~~ *52.2-99.*

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

MERV 17	*99.97%*
MERV 16	*95%*
MERV 14-15	*90-95%*
MERV 12-14	*80-90%*
MERV 10-11	*60-70%*
MERV 9-10	*50-60%*
MERV 8	*40-50%*
MERV 6-7	*25-30%*
MERV 6	*20-30%*
MERV 5	*<20%*

9 *FREESTANDING SURGICAL* OUTPATIENT FACILITIES *(FSOF)*

9.1 General

9.1.A Section Applicability

This section applies to ~~the outpatient unit in a hospital or a~~ Freestanding Surgical Outpatient Facility *(FSOF)* within a nonmedical 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 ~~should~~ *are* not *intended to* be applied to such offices in ancillary outpatient facilities.

~~The general standards set forth in Sections 9.1. and 9.2. apply to each of the items below. Additions and/or modifications shall be made as described for the specific facility type.~~

~~Specialty facilities, such as those for renal dialysis, cancer treatment, mental health, rehabilitation, etc., have needs that are not addressed here. They must satisfy additional conditions to meet respective programs' standards.~~

~~Specifically described are:~~

~~9.1.A1. Primary Care Outpatient Center (Section 9.3.)~~

~~9.1.A2. The Small Primary (Neighborhood) Outpatient Facility (Section 9.4.)~~

~~9.1.A3. The Outpatient Surgical Facility (Section 9.5.)~~

~~9.1.A4. The Freestanding Emergency Facility (Section 9.6.)~~

~~9.1.A5. Freestanding Birthing Center (Section 9.7.)~~

9.1.B *Functions* ~~Outpatient Facility Classification~~

~~Except for the emergency unit, the outpatient facilities described herein are used primarily by patients capable of traveling into, around, and out of the facility unassisted. This includes the disabled confined to wheelchairs. Occasional facility use by stretcher patients should not be used as a basis for more restrictive institutional occupancy classifications.~~

~~Facilities shall comply with the "Ambulatory Health Care Centers" Section of NFPA 101, in addition to details herein, where patients incapable of self-preservation or those receiving inhalation anesthesia are treated. The "Business Occupancy" section of NFPA 101 applies to other types of outpatient facilities. Outpatient units that are part of another facility may be subject to the additional requirements of the other occupancy.~~

~~References are made to Section 7., General Hospital, for certain service spaces, such as the operating rooms of the outpatient surgical unit. Those references are intended only for the specific areas indicated.~~ *There shall be for each project an operational narrative for the facility consistent with Section 1.1.C.*

9.1.C *Standards* ~~Facility Access~~

~~Where the outpatient unit is part of another facility, separation and access shall be maintained as described in NFPA 101. Building entrances used to reach the outpatient services shall be at grade level, clearly marked, and located so that patients need not go through other activity areas. (Lobbies of multi-occupancy buildings may be shared.) Design shall preclude unrelated traffic within the unit.~~

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

Refer to federal Ambulatory Surgical Center certification and State of Michigan FSOF licensing rules for other requirements.

~~**9.1.D. Operational Narrative Provision**~~

~~Each project sponsor shall provide an operational narrative for the facility. (See Section 1.1.C.)~~

~~**9.1.E. (Not Used)**~~

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

~~Community outpatient units shall be conveniently accessible to patients and staff via available public transportation.~~

9.1.*E*.~~G.~~ ~~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 a formal parking study, ~~parking for outpatient facilities shall be provided at the rate noted for each type of unit.~~ *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*.~~H.~~ ~~Each facility design shall ensure patient visual privacy and dignity during interviews, examinations, treatment, and recovery.~~

~~Audible privacy is the objective for all open interview, registration or discharge areas.~~

~~Noise reduction criteria shown in Table 1 of Chapter 7 for patient rooms shall apply to partitions, floors, and ceiling construction in all separate interview, examination, treatment and recovery areas.~~

9.2 *Non-Clinical Support* ~~Common Elements for Outpatient~~ Facilities

~~The following shall apply to each outpatient facility described herein with additions and/or modifications as noted for each specific type. Special consideration shall be given to needs of children for pediatric services.~~

~~**9.2.A. Administration and Public Areas**~~

9.2.A.~~1~~. ~~(Not Used)~~ *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.*~~A2.~~ ~~Public services shall include:~~ *Provide a reception counter or desk, waiting space(s), accessible public toilet rooms, public telephone(s), and drinking fountain(s).*

~~a. Conveniently accessible wheelchair storage out of the path of normal traffic~~

~~b. A reception and information counter or desk~~

~~c. Waiting space(s). Where an organized pediatric service is part of the outpatient facility, provisions shall be made for separating pediatric and adult patients.~~

~~d. Conveniently accessible public toilet rooms~~

~~e. Conveniently accessible public telephone(s)~~

~~f. Conveniently accessible drinking fountain(s)~~

~~9.2.A3. Interview space(s) for private interviews related to social service, credit, etc., shall be provided.~~

9.2.*C.*~~A4.~~ *Provide* ~~G~~general or individual office(s) for business transactions, records, administrative, and professional staffs~~ shall be provided~~. 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.A5. Clerical space or rooms for typing, clerical work, and filing, separated from public areas for confidentiality, shall be provided.~~

~~9.2.A6. Multipurpose room(s) equipped for visual aids shall be provided for conferences, meetings, and health education purposes.~~

~~9.2.A7. Special storage for staff personal effects with locking drawers or cabinets (may be individual desks or cabinets) shall be provided.~~

~~9.2.A8. General storage facilities for supplies and equipment 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.B. Clinical Facilities**~~

~~The following elements shall be provided.~~

~~9.2.B1. General-purpose examination room(s). For medical, obstetrical, and similar examinations, rooms shall have a minimum floor area of 80 square feet (7.43 square meters), excluding vestibules, toilet rooms, and closets. Room arrangement shall permit at least 2 feet 8 inches (81.28 cm) clearance at each side and at the foot of the examination table. Handwashing facilities consistent with 2.1.A. and a counter or shelf space for writing shall be provided.~~

9.2.B2. Special-purpose examination rooms. Rooms for special clinics such as eye, ear, nose, and throat examinations, if provided, shall be designed and outfitted to accommodate procedures and equipment used. Handwashing facilities consistent with 2.1.A., and a counter or shelf space for writing shall be provided.

9.2.B3. Treatment room(s) shall have a minimum floor area of 120 square feet (11.15 square meters), excluding vestibules, toilet rooms, and closets. Handwashing facilities consistent with 2.1.A. and a counter or shelf for writing shall be provided. If a sink is used for the disposal of plaster of Paris, a plaster trap shall be provided.

9.2.B4. Observation room(s). Observation rooms for the seclusion of disturbed patients shall have a minimum floor area of 80 square feet (7.43 square meters) and shall be convenient to a nurse or control station. An examination room may be used to accommodate this function.

9.2.B5. Nurses station(s). A work counter, communication system, space for supplies, and provisions for charting shall be provided.

9.2.B6. Drug distribution station. This may be a part of the nurses station and shall include a work counter, sink, refrigerator, and locked storage for biologicals and drugs.

9.2.B7. Clean storage. A separate room for storing clean and sterile supplies shall be provided.

9.2.B8. Soiled holding. A separate room shall be provided for collection, storage, and disposal of soiled materials.

9.2.B9. Sterilizing facilities. A system for sterilizing equipment and supplies shall be provided.

9.2.B10. Wheelchair storage space. Such storage shall be out of the direct line of traffic.

9.2.B11. The need for and number of required airborne infection isolation rooms shall be determined by an infection control risk assessment, as defined in Section 2.1.G. When required, the airborne infection isolation room(s) shall comply with the general requirements of Section 7.2.C.

9.2.C. Radiology (See Section 7.10.)

9.2.C1. Radiographic room(s). See Section 7.10.A1. for special requirements.

9.2.C2. Film processing facilities shall be provided consistent with the requirements of Section 7.10.B9.

9.2.C3. Viewing and administrative areas(s) shall be provided consistent with the requirements of Section 7.10.B10.

9.2.C4. A film storage space shall be provided consistent with the requirements of Section 7.10.B6.

9.2.C5. Toilet rooms with handwashing facilities consistent with the requirements of Section 2.1.A. shall be provided with direct access from each ultrasound and fluoroscopic room.

9.2.C6. Dressing rooms or booths with convenient toilet room access shall be provided.

9.2.D. Laboratory (See Section 7.12.)

Facilities shall be provided within the outpatient department, or through an effective contract arrangement with a hospital or laboratory service. If these services are provided on contract, the following laboratory facilities shall also be provided in (or be immediately accessible to) the outpatient facility.

9.2.D1. Laboratory work counter(s) with sink.

9.2.D2. Lavatory(ies) or counter sink(s) equipped for handwashing consistent with the requirements of Section 2.1.A.

9.2.D3. Storage cabinet(s) or closet(s).

9.2.D4. Specimen collection facilities with a water closet and lavatory. Blood collection facilities shall have seating space, a work counter, and handwashing facilities consistent with the requirements of Section 2.1.A.

9.2.E. Housekeeping Room(s)

9.2.F In addition to the housekeeping rooms required in certain departments, sSufficient housekeeping rooms consistent with the requirements of Section 2.1.H17. 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.F. Staff Facilities

Staff locker rooms and toilet rooms shall be provided.

9.2.G. Engineering Service and Equipment Areas

The following shall be provided.

9.2.G1. Equipment room(s) for boilers, mechanical equipment, and electrical equipment.

9.2.*G.*2. *A general* Sstorage room(s) for supplies and equipment*. shall be provided to meet the needs of the facility.*

9.2.G3. Waste processing services consistent with the requirements of Section 7.30.C. shall be provided.

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

9.2.H. Details and Finishes

*9.2.H1. In addition to the following, details shall be consistent with the requirements of Sections 7.28.A3., 7.28.A6., 7.28.A8., 7.28.A13., 7.28.A20., 7.28.A22. to 7.28.A29.:

a. Minimum public corridor width shall be 5 feet (1.52 meters). Corridors used for patient entry, egress, and for surgical care areas in a facility shall have a minimum width of 6 feet (1.83 meters). (***Note: Revised section moved to 9.4.A.)*

b. Each building shall have at least two exits that are remote from each other. Other details relating to exits and fire safety shall comply with NFPA 101 and the standards outlined herein. *(**Note: Revised section moved to 9.4.B.)*

c. Handwashing facilities shall be consistent with the requirements of Section 2.1.A.

9.2.H2. Finishes shall be consistent with the requirements of Section 7.28.B.

9.2.I. Design and Construction, Including Fire-Resistive Standards (Not Used)

*9.2.I1. (Not Used)

*9.2.I2. (Not Used)

*9.2.I3. (Not Used)

***9.2.J. Provision for Disasters** (Not Used)

9.3. Primary Care Outpatient Centers (Not Used)

9.4. Small Primary (Neighborhood) Outpatient Facility (Not Used)

9.5. Outpatient Surgical Facility

In addition to the requirements of Section 9.2., the following shall be provided.

9.5.A. General

Outpatient surgery is performed without anticipation of overnight patient care. The operational narrative shall describe in detail staffing, patient types, hours of operation, function and space relationships, transfer provisions, and availability of off-site services.

Procedures performed on persons who are known or suspected of having airborne infectious disease shall be performed in a room meeting airborne infection isolation ventilation requirements or in a space using local exhaust ventilation, in accordance with the "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuburculosis in Health Care Facilities."

Visual and audible privacy shall be provided by design and include the registration, preparation, examination, treatment, and recovery areas.

9.5.B. Size (Not Used)

9.5.C. Parking

Parking shall be provided consistent with Section 9.1.G. 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.

9.5.D. Administration and Public Areas

~~The following shall be provided:~~

~~9.5.D1. A covered entrance for pickup of patients after surgery~~

~~9.5.D2. (Not Used)~~

~~9.5.D3. (Not Used)~~

~~9.5.D4. (Not Used)~~

~~9.5.D5. (Not Used)~~

~~9.5.D6. A medical records room equipped for dictating, recording, and retrieval~~

~~9.5.D7. (Not Used)~~

~~9.5.D8. (Not Used)~~

~~**9.5.E. Sterilizing Facilities**~~

~~A system for sterilizing equipment and supplies shall be provided consistent with the requirements of Section 7.21.A.~~

~~9.5.E1. Soiled Workroom (Not Used)~~

~~9.5.E2. Clean Assembly/Workroom (Not Used)~~

~~9.5.E3. Clean/Sterile Supplies (Not Used)~~

9.*3*.~~5.F.~~ Clinical Facilities

~~Provisions shall be made to separate pediatric from adult patients. This shall include pre- and post-operative care areas and shall allow for parental presence.~~

~~9.5.F1. At least one room shall be provided for examination and testing of patients prior to surgery, assuring both visual and audible privacy. This may be an examination room or treatment room as described in Sections 9.2.B1. and 3.~~

9.*3.A*.~~5.F2~~. Each operating room shall have a minimum clear area of ~~360~~ *400* square feet, exclusive of cabinets and shelves.~~, but may be larger to accommodate the operational narrative which requires additional staff and/or equipment.~~ Where justified by the operational narrative~~,~~ *for use in eye, endoscopy, or other minor procedures that only require local anesthesia,* the room may be reduced to a minimum clear area of 200 square feet. ~~Rooms that will be dedicated to laser procedure shall have a minimum clear area of 400 square feet (37.16 square meters), exclusive of cabinets and shelves.~~ An emergency communication system connected with the surgical suite control station shall be provided. There shall be at least one X-ray film illuminator in each room *unless the operational narrative clearly delineates how radiological images will be viewed in the operating rooms without the use of illuminators.*

9.3.B *Preoperative and recovery patient holding area(s) shall be provided that comply with the requirements of 2.1.C and the operational narrative. If general anesthetics are to be used a*

PACU shall be provided as per the operational narrative and section 2.1.I1. Provisions to comply with sections 2.1.H6 and 2.1.H7 shall be made within or immediately adjoining the PACU.

~~9.5.F3. Room(s) for recovery of outpatient surgical patients shall be provided consistent with the requirements of Sections 7.7.C14. and 2.1.C. Recovery areas shall be provided in sufficient number to accommodate the patient load. At least one stretcher station shall be provided.~~

9.3.C *Service areas shall be provided consistent with the requirements of Section 2.1.H parts 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 17, 20, and 21.*

9.3.D *Facilities shall be provided for reprocessing of medical and surgical equipment, instruments, and supplies compliant with sections 7.7.A5, 7.7.C3, 7.21.A, 7.21.B, 7.21.C1, 7.21.C2, and 7.21.E.*

Facilities for emergent reprocessing of surgical patient care items for immediate use may be located in central services if convenient.

9.3.E *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. ~~Scrub sinks shall be located outside the clean core.~~*

9.3.F *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.G. *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.H *Each surgical suite shall provide sufficient storage area to keep its required corridor width free of equipment and supplies, but not less than 150 square feet (13.94 square meters) or 50 square feet (4.65 square meters) per operating room, whichever is greater.*

9.3.I *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.*

~~9.5.F4. (Not Used)~~

~~9.5.F5. The services listed in Section 7.7.C. shall be provided.~~

~~**9.5.G. Diagnostic Facilities**~~

~~Diagnostic services shall be provided on- or off-site for preadmission tests, as required by 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 nonslip 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 *Ceilings, including exposed structure, shall be cleanable with routine housekeeping equipment. In operating rooms, film processing rooms/areas, and sterile processing rooms, provide ceilings that are smooth and free of fissures, open joints, or crevices and minimize retention or passage of dirt particles.*

~~**9.5.H. Details and Finishes**~~

~~All details and finishes shall meet the standards in Section 9.2.H. and below.~~

~~9.5.H1. Details shall conform to the following guidelines:~~

~~a. (Not Used)~~

~~b. (Not Used)~~

~~c. Toilet rooms shall be consistent with the requirements of Section 7.28.A4.~~

~~d. Flammable anesthetics shall not be used in outpatient surgical facilities.~~

~~9.5.H2. Finishes shall conform to the following guidelines:~~

~~a. Walls shall be consistent with the requirements of Section 7.28.B6.~~

~~b. Ceilings shall be consistent with the requirements of Section 7.28.B8.~~

9.6. Freestanding Emergency Facility (Not Used)

***9.7. Freestanding Birthing Center** (Not Used)

***9.8. Freestanding Outpatient Diagnostic and Treatment Facility** (Not Used)

***9.9. Endoscopy Suite**

All standards set forth in Sections 9.31. and 9.32. shall be met for new construction of endoscopy suites with modifications described in Section 9.9.

Procedures performed on persons who are known or suspected of having airborne infectious disease shall be performed in a room meeting airborne infection isolation ventilation requirements or in a space using local exhaust ventilation, in accordance with the "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuburculosis in Health Care Facilities."

9.9.A. Procedure Room(s)

*9.9.A1. Each procedure room shall have a minimum clear area of 200 square feet (15 square meters) exclusive of fixed cabinets and built-in shelves.

9.9.A2. A handwashing fixture consistent with the requirements of Section 2.1.A. shall be provided in each procedure room.

9.9.A3. Provide station outlets for oxygen and vacuum (suction). See Table 5, Section 7.7.A4.

9.9.A4. Floor covering and perimeter bases shall be monolithic and joint-free.

9.9.A5. A system for staff emergency communication shall be provided consistent with the requirements of Section 7.32.G4.

9.9.A6. Procedure rooms shall be designed for visual and audible privacy for the patient consistent with the requirements of Section 9.1.H.

9.9.B. Instrument Processing Room(s)

*9.9.B1. Dedicated processing room(s) for cleaning and disinfecting instrumentation shall be provided.

9.9.B2. The decontamination room shall meet the following requirements:

a. Two utility sinks shall be provided remote from each other.

b. A free-standing handwashing fixture shall be provided consistent with the requirements of Section 2.1.A.

c. Work counter space(s)

d. Space for automatic endoscope cleaners, sonic processor, and flash sterilizers (where required).

e. Ventilation system. Negative pressure with a minimum of 10 air changes per hour shall be maintained. All air shall be exhausted to the outside to avoid recirculation within the facility.

f. Outlets for vacuum and compressed air shall be provided.

g. Floor covering and perimeter bases shall be monolithic and joint-free.

9.9.C. Patient Holding/Prep/Recovery Area

A patient holding/preparation/recovery area shall be provided consistent with the requirements of Section 2.1.C.

9.10. Cough-Inducing and Aerosol-Generating Procedures

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.

9.11. Reserved

9.12. Reserved

9.13. Reserved

9.14. Reserved

9.15. Reserved

9.16. Reserved

9.17. Reserved

9.18. Reserved

9.19. Reserved

9.20. Reserved

9.21. Reserved

9.22. Reserved

9.23. Reserved

9.24. Reserved

9.25. Reserved

9.26. Reserved

~~**9.27. Reserved**~~

~~**9.28. Reserved**~~

~~**9.29. Reserved**~~

~~**9.30. Special Systems**~~

~~**9.30.A. General** (Not Used)~~

9.*6.*~~30.B.~~ Elevators

9.*6.A*~~.30.B1.~~ 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 ~~*a.*~~*If required, A*~~a~~t 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.

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

~~b. Elevators shall be equipped with a two-way automatic level-maintaining device with an accuracy of ±1/2 inch (±1.27 cm).~~

~~c. Elevator call buttons and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors.~~

~~d. Elevator controls, alarm buttons, and telephones shall be accessible to wheelchair occupants and usable by the blind.~~

9.*6.C*~~.30.B2.~~ Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this Section, as well as all applicable safety regulations and codes.

9.*7.*~~30.C.~~ Waste Processing Services

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

9.*8.*~~31.~~ Mechanical Standards

~~**9.31.A. General**~~

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

~~**9.31.B. Thermal and Acoustical Insulation** (Not Used)~~

~~**9.31.C. Steam and Hot Water Systems**~~

9*.8.B*.~~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.~~ *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.*

~~**9.31.D. Air Conditioning, Heating, and Ventilation Systems**~~

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

~~**9.31.E. Plumbing and Other Piping Systems**~~

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

9.9.~~32.~~ Electrical Standards

~~**9.32.A. General**~~

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

~~**9.32.B. Services, Switchboards, Panelboards, and Transformers.**~~

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

~~**9.32.C. Panelboards** (Not Used)~~

~~**9.32.D. Lighting**~~

9*.9.C*.~~32.D1.~~ Lighting shall ~~meet or exceed the minimum illumination levels listed in Table 12.~~ *comply with section 7.32.D.*

~~9.32.D2. (Not Used)~~

~~9.32.D3. Approaches to buildings and parking lots and all occupied spaces shall have fixtures for lighting that can be illuminated as necessary.~~

~~9.32.D4. (Not Used)~~

~~9.32.D5. A portable or fixed examination light shall be provided for examination, treatment, and trauma rooms.~~

~~9.32.D6. Operating rooms shall have general lighting in addition to special lighting units provided at surgical tables. General lighting and special lighting shall be on separate circuits.~~

~~9.32.D7. Light fixtures shall be equipped with lenses or shields for protection of the lamps or with lamps which will not shatter.~~

~~**9.32.E. Receptacles (Convenience Outlets)**~~

9.9.D Duplex grounded-type receptacles (convenience outlets) shall be installed ~~in all areas in sufficient quantities for tasks to be performed consistent with the operational narrative and~~ consistent with the requirements of Section 7.32.E. ~~Each examination and work table shall have access to a minimum of two duplex receptacles.~~

~~**9.32.F. Equipment** (Not Used)~~

~~**9.32.G. Nurse Call System**~~

9.9.E A nurse call system shall be ~~provided consistent with the requirements of~~ installed compliant with Section~~s~~ 7.32.G~~2. and 7.32.G3.4.~~

~~**9.32.H. Emergency Electrical Service**~~

9.9.F Emergency lighting and power shall be provided consistent with NFPA 99, NFPA 101, and NFPA 110.

~~**9.32.I. Fire Alarm System** (Not Used)~~

~~**9.32.J. Telecommunications and Information Systems**~~

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 MDCH.

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

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:

a. Psychological services

b. Social services

c. 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 2.1.H5., 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 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 Overall 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

Shall be provided 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 at 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, each nursing unit shall provide 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 *accessibility requirements of Chapter 11 of the Michigan Building Code* ~~barrier-free design criteria~~ 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 2.1.H., 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 that 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 ~~island-type bathtub~~ *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 ~~at least~~ 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 Patient Toilet Facilities (Not Used)

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.

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:

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 Patient rooms intended for 24-hour occupancy shall have windows that operate without the use of tools and shall have sills not more than 3 feet above the floor.

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, 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. ~~A clear distance of 1-1/2 inches (3.81 cm) shall be provided between the handrail and the wall, and the top of the rail shall be about 32 inches (81.28 cm) above the floor, except for special care areas, such as those serving children.~~ *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. Design and Construction, Including Fire-Resistant Standards (Not Used)

10.26 Reserved

10.27 Reserved

10.28 Reserved

10.29 Reserved

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

(Not Used)

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 MDCH.

Mobile, transportable, and relocatable units (herein called units) shall be approved by the Bureaus of Health Systems and Construction Codes, as well as the Office of Fire Safety. Cardiac catheterization units shall also be approved by the Radiological Safety Section of the Bureau of Health Systems 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

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.

~~**12.5.A. Patient Holding Areas**~~

~~Patient holding facilities shall be consistent with the requirements of Section 2.1.C. and be located convenient to the unit(s).~~

~~**12.5.B. Patient Change Facilities**~~

~~Patient dressing rooms shall be provided that are equipped with private dressing spaces that include a seat or bench, secured storage for patient belongings, and waiting areas designed to assure visual privacy. Toilet rooms shall be provided that are conveniently located to the dressing rooms.~~

~~**12.5.C. Service Areas**~~

~~Service areas shall be consistent with the requirements of Section 2.1.H. and be located convenient to the unit(s).~~

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.

~~**12.6.B.** Support facilities serving MRI unit(s) shall accommodate cryogen servicing of the magnet.~~

~~**12.6.C.** Clearly visible warning signs shall be provided within the support facility at or beyond the 5 gauss field strength limit.~~

~~**12.6.D.** Separate housekeeping closet or space within the housekeeping closet shall be conveniently provided for nonmagnetic cleaning equipment.~~

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. - 29, 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 Reserved

12.10 Reserved

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12.30 Reserved

12.31 Mechanical Standards

12.31.A Transportable Units, Relocatable Units, and Support Facilities

12.31.A1 These units and 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 9.31. for outpatient facilities).

12.31.A2 These units and facilities shall be consistent with the electrical requirements of Section 7.32.

12.31.B Mobile Units

12.31.B1 Units shall be consistent with the mechanical requirements of Sections 9.31.A., 9.31.B., 9.31.D., 7.31.E3.a., 7.31.E4.g., 7.31.E5., 7.31.E6., 7.31.E7., and 7.31.E9. HVAC filters for services, other than cardiac catheterization, need only comply with the standards for administrative areas (25 percent efficiency).

12.31.B2 Domestic air intakes in the unit, support facility, and host facility shall be located at least 25 feet (7.62 meters) from all plumbing vents, exhaust fans, and sources of combustion fumes, including the units emergency generator.

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 General

12.32.A1 All electrical material and equipment, including conductors, controls, and signaling devices shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99 and shall be listed as complying with available standards of listing agencies or other similar established standards where such standards are required.

12.32.A2 (Not Used)

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.A3 (Not Used)

12.32.A4 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.B Switchboards, overload protective devices, and panelboards shall be consistent with the requirements of Section 7.32.B.

12.32.C (Not Used)

12.32.D Lighting

12.32.D1 Lighting shall be consistent with the requirements of Section 7.32.D.

12.32.D2 (Not Used)

12.32.D3 (Not Used)

12.32.D4 (Not Used)

12.32.D5 (Not Used)

12.32.D6 Light fixtures shall be equipped with lenses or shields for protection of the lamps or with lamps that will not shatter.

12.32.E Duplex grounded-type receptacles (convenience outlets) 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.F Equipment (Not Used)

12.32.G Reserved

12.32.H Emergency Electrical Service

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 (Not Used)

12.32.J Telecommunications and Information Systems

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.

Table 12

Illumination of Health Care Facilities

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 (C-Section)/Trauma Rooms * …….……..…… 150 fc

Illumination levels over the Operating/Delivery/Trauma Room table shall be a minimum of 150 footcandles (fc) and within a six foot perimeter of the Operating/Delivery/Trauma Room table; the remainder of the room shall be a minimum of 75 fc.

**Provide additional fixed task lighting. Task lighting shall be on Emergency Power.*

Critical Task Areas ……..……. 75 fc

- *Cath Labs **
- *Angiography **
- *Interventional Radiology **
- *Scrub sinks*
- *Central Sterile task locations*
- *Patient exam locations***
- *Decontamination task locations*
- *Pharmacy workstations*
- *PACU*
- *Endoscopy/Bronoscopy*
- *Minor procedure rooms***
- *Autopsy **

** Provide additional fixed task lighting. Task lighting shall be on Emergency Power*

*** Provide task lighting consistent with 7.32.D8.*

The 75 fc is the minimum for patient examination, resuscitation, or a minor 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.

Critical Task Areas were more closely defined as including intensive care units, cardiac care units, neonatal intensive care units, surgical intensive care units, neurological intensive care units, pediatric intensive care units, cardiovascular holding areas (if recovery takes place in said space), LDRP's, LDR's, and PACU.

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.

Specialized Task Areas ……..……..……. 50 fc

- *Food service work counter*
- *Medication preparation and dispensing locations, exclusive of Pharmacies*
- *Nurse, Physician and Clinician charting locations*
- *Laboratory task locations*
- *Triage areas*
- *Hot Lab task locations*

Task Areas ……. 30 fc

- *Patient care locations, non-exam*
- *Handwashing and assisted tub/shower*
- *Staff workcounter*
- *Support services areas*
- *Day/dining in long term care facilities*
- *Patient Reading Locations*
- *Dialysis Patient Locations*
- *Patient Prep, Pre-Op and Holding areas*
- *General Radiology Rooms, MRI, PET, CT, and Lithotripsy*
- *Morgue*

General Areas ……..……..……. 15 fc

- *Corridors/elevators/waiting rooms**
- *General patient room/location*
- *Water closets/self-bath/shower*
- *Storage/holding*
- *Clean and soiled utility rooms*
- *Locker rooms*
- *Janitor closets*
- *Stairways*

**At least 5 fc of illumination shall be provided for night lighting.*

It is recommended that 1 fc of illumination be provided in OR's C-Section and Trauma Rooms during transfer to emergency power.

It is important to note that lighting levels decrease as bulbs age (lumen depreciation), so meeting minimum levels when installed, may create lighting levels below the minimum at a later date.

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.

Table 13
Electrical Convenience Receptacles Requirements for Clinical Areas

Area Designation	Number	Locations
Patient Bed Locations		
Medical, Surgical, Pediatric, Postpartum, Physical Rehabilitation	8	Convenient to head of bed with one on each wall.
Critical Care/Neonatal ICU/Pediatric ICU	16	
Psychiatric/Substance Abuse	No minimum	
Newborn or Special Care Nursery	12	Convenient to 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	Convenient to table placement with
Trauma/Resuscitation/Cardiac emergency room	16	Convenient to head of stretcher or bed.
Emergency Care - general	12	Convenient to head of stretcher or bed.
General Care/Treatment	8	Convenient to head of stretcher or bed.
Cardiac Catheterization/Interventional Radiology/Angiography	8	Convenient to table placement with one on each wall

Notes:

1. May be single or duplex type or a combination of both.
2. 50% of outlets shall be on emergency power and 50% on normal power at head of patient beds, OR's, Delivery Rooms and Trauma/ Resuscitation/Cardiac emergency rooms.
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 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.
8. “Hospital grade” receptacles shall be provided consistent with NFPA 70 and so identified.

Table 14

Location of Nurse Call Devices

KEY:

● Required

☐ Optional

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
Nursing (Chapter 8) Bed Location	☐	·	●	·	·		1, 2
Patient Water Closets, Showers, and Baths		●	·				3
Nurse Station/Charting Room					●	☐	
Clean Workroom						●	
Clean Supply Room						☐	
Soiled Workroom						●	
Soiled Holding Room						☐	
Medication Station						●	
Examination/Treatment Room						●	
Nurse Lounge						●	
Clean Linen Storage						☐	
Nourishment Station						☐	
Equipment Storage Room						☐	
Multi-Purpose Room (2.1.H4)						☐	
Other Clinical Areas							
Operating/Delivery Rooms	·	·	●	☐	·	·	3, 4
Endoscopy/Minor Procedure Rooms	·	·	●	☐	·	·	3, 4
LDR/LDRP	●	·	●	●	●	·	3, 4
Recovery - Phase 1	☐	·	●	●	☐	·	3, 4
Recovery - Phase 2	●	·	●	☐	☐	·	3, 4

Table 14 (Continued)
Location of Nurse Call Devices

KEY:
● Required
☐ Optional

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	●		●	●	☐	·	3, 4, 5
Patient Preparation and Holding Areas	●	·	●	●	☐	·	1, 2, 4, 5
Critical Care Bed Locations	●	·	●	●	●	·	1, 2, 4
Nurseries	·	·	●	●	●	·	1, 2, 4, 5
Cardiac Cath/Interventional Rad/Angiography	☐	·	●	●	·	·	3, 4
MRI, CT, PET Areas	☐	·	●	●	·	·	3, 4
Stress Test Areas	☐	·	●	·	·	·	3, 4
Patient Waiting and Changing Areas	☐	·	☐	·	·	·	3, 4
Psychiatric Seclusion Ante/Exam Rooms	·	·	●	·	·	·	3, 4
Patient Toilet Rooms/Showers/Baths		●					3

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 station and all duty stations. In multi-corridor nursing units, additional visible signals shall be installed at corridor locations.
3. Patient Stations shall 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 Patient Station where it was initiated.
4. The Duty Stations locations in clinical areas should be determined based on the operational narrative for the system.
5. Nurse Call Systems in Nurseries, Patient Preparation and Holding Areas and Exam/Treatment Areas may be deleted if justified in the Operational Narrative.

APPENDIX A

A.1.5 Reference codes and standards

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). 1993 Fundamentals Handbook.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers. Standard 52-92, (ASHRAE 52.1-92), Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers. Standard 55-92, (ASHRAE 55-92), Thermal Environmental Controls for Human Occupancy.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers. Standard 62-89, (ASHRAE 62-89), Ventilation for Acceptable Indoor Air Quality.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers. 1995 Applications Handbook.

Centers for Disease Control and Prevention (CDC). "Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities." Morbidity and Mortality Weekly Review 1994:43 (No. RR-13).

Centers for Disease Control and Prevention (CDC). "Guidelines for Prevention of Nosocomial Pneumonia, 1994." American Journal of Infection Control (22:247-292).

Illuminating Engineering Society of North America. Lighting Handbook. (Vol. 2, Applications).

Illuminating Engineering Society of North America. IESNA publication CP29, Lighting for Health Facilities.

Illuminating Engineering Society of North America. IESNA publication RP28, Lighting for Senior Housing.

National Council on Radiation Protection (NCRP). Medical X-ray and Gamma Ray Protection for Energies Up to 10 MeV Equipment Design and Use.

National Council on Radiation Protection (NCRP). Medical X-ray and Gamma Ray Protection for Energies up to 10 MeV Structural Shielding Design and Evaluation.

National Council on Radiation Protection (NCRP). Radiation Protection Design Guidelines for 0.1pi29100, MeV Particle Accelerator Facilities.

National Fire Protection Association. NFPA 20. Centrifugal Fire Pumps.

NFPA 70. National Electrical Code, as amended and promulgated by the Michigan Department of Consumer & Industry Services Bureau of Construction Codes, Electrical Division.

NFPA 72. Standard for the Installation, Maintenance, and Use of Protective Signaling Systems.

NFPA 80. Standard for Fire Doors and Windows.

NFPA 82. Standard on Incinerators, Waste and Linen Handling Systems and Equipment.

NFPA 90A. Standard for the Installation of Air Conditioning and Ventilating Systems.

NFPA 96. Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment.

NFPA 99. Standard for Health Care Facilities.

NFPA 101. Life Safety Code.

NFPA 110. Emergency and Standby Power Systems.

NFPA 253. Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

NFPA 255. Standard Method of Test of Surface Burning Characteristics of Building Materials.

NFPA 258. Standard Research Test Method for Determining the Smoke Generation of Solid Materials.

NFPA 701. Standard Method of Fire Tests for Flame-Resistant Textiles and Films.

NFPA 801. Recommended Fire Protection Practice for Facilities Handling Radioactive Materials.

A1.5.1 Availability of Codes and Standards

The codes and standards that are U.S. government publications can be ordered from the Superintendent of Documents, U.S. Government Printing Office (GPO), Washington, D.C. 20402.

American National Standards Institute
1430 Broadway
New York, N.Y. 10018

American Society of Heating, Refrigerating, and Air-Conditioning Engineers
1741 Tullie Circle, NE
Atlanta, GA. 30329

American Society for Testing and Materials (ASTM)
1916 Race Street
Philadelphia, PA. 19103

Illuminating Engineering Society of North America (IESNA)
IES Publication Sales
345 East 47th Street
New York, N.Y. 10017

National Council on Radiation Protection and Measurement
7910 Woodmont Avenue, Suite 1016
Bethesda, MD 20814

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

Underwriter's Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062

Michigan Department of Labor & Economic Growth (DLEG)
Bureau of Construction Codes
(Barrier Free Design, Elevators, Plumbing and Electrical, Boilers and Mechanical)
2501 Woodlake Circle
Okemos, MI 48864
517-241-9309
www.michigan.gov/bccfs
Mailing Address: P.O. Box 30254
Lansing, MI 48909

Michigan Department of Labor & Economic Growth (DLEG)
Office of Fire Safety
7150 Harris Drive
Lansing, MI 48913
www.michigan.gov/bccfs
Mailing Address: P.O. Box 30700
Lansing, MI 48909-8200

Michigan Department of Community Health (MDCH)
Bureau of Health Systems – Division of Health Facilities & Services
Health Facilities Engineering Section (HFES)
320 S. Walnut Street
Lewis Cass Building – 3rd Floor
Lansing, MI 48913
www.michigan.gov/hfes