7.~~12~~15 Laboratory Suite

Laboratory facilities shall be provided for the performance of tests in hematology, clinical chemistry, urinalysis, microbiology, anatomic pathology, cytology, and blood banking to meet the workload described in the functional program. Certain procedures may be performed on-site or provided through a contractual arrangement with a laboratory service acceptable to the authority having local jurisdiction.

Provisions shall be made for the following procedures to be performed on-site: blood counts, urinalysis, blood glucose, electrolytes, blood urea and nitrogen (BUN), coagulation, ~~and~~ transfusions (type and cross-match capability), and STAT gram stains. Provisions shall also be included for specimen collection and processing.

The functional program shall describe the type and location of all special equipment that is to be wired, plumbed, or plugged in, and the utilities required to operate each.

Note: Refer to NFPA code requirements applicable to hospital laboratories, including standards clarifying that hospital units do not necessarily have the same fire safety requirements as commercial chemical laboratories.

The following physical facilities shall be provided within the hospital:

7.~~12.~~.15.A.
Laboratory work counter(s) with space for microscopes, appropriate chemical analyzer(s), incubator(s), centrifuge(s), biosafety hoods, etc. ~~shall be provided.~~ Work areas shall include sinks with water and access to vacuum, gases, and air, and electrical services as needed.

7.~~12.~~.15.B.
Refrigerated blood storage facilities for transfusions ~~shall be provided~~. Blood storage refrigerator shall be equipped with temperature-monitoring and alarm signals.

7.~~12.~~.15.C.
~~Lavatory(ies) or counter sink(s) equipped for handwashing shall be provided. Counter sinks may also be used are permitted for disposal of nontoxic fluids.~~Dedicated handwashing stations shall be provided within 25 feet (7.62 meters) of each work station and within each room.

***7.~~12.~~.15.D.**
Storage facilities, including refrigeration, for reagents, standards, supplies, and stained specimen microscope slides, etc. ~~shall be provided.~~ Such facilities shall conform to applicable NFPA standards.

7.~~12.~~.15.E.
A ~~S~~specimen (blood, urine, and feces) collection facility ~~shall be provided~~. The ~~B~~blood collection area shall have a work counter, space for patient seating, and handwashing stations. The ~~U~~urine and feces collection ~~room~~ facility shall be equipped with a water closet and ~~lavatory~~handwashing station. This facility may be located outside the laboratory suite.

7.~~12.~~.15.F.
Chemical safety provisions including emergency shower, eyeflushing devices, and appropriate storage for flammable liquids, etc.~~, shall be made~~.

7.~~12.~~.15.G.
Facilities and equipment for terminal sterilization of contaminated specimens before transport (autoclave or electric oven) ~~shall be provided~~. (Terminal sterilization is not required for specimens that are incinerated on-site.)

7.~~12.~~.15.H.
If radioactive materials are employed, facilities ~~shall be available~~ for long-term storage and disposal of these materials. No special provisions will normally be required for body waste products from most patients receiving low-~~-~~level isotope diagnostic material. Requirements of authorities having jurisdiction should be verified.

7.~~12.~~.15.I.
Administrative areas including offices as well as space for clerical work, filing, and record maintenance ~~shall be provided~~.

7.~~12.~~.15.J.
Lounge, locker, and toilet facilities ~~shall be~~ conveniently located for male and female laboratory staff. These may be outside the laboratory area and shared with other departments.

~~The functional program shall describe the type and location of all special equipment that is to be wired, plumbed, or plugged in, and the utilities required to operate each.~~

~~**Note**: Refer to NFPA code requirements applicable to hospital laboratories, including standards clarifying that hospital units do not necessarily have the same fire safety requirements as commercial chemical laboratories.~~

7.~~13~~16 Rehabilitation Therapy Department

7.~~13.~~.16.A. General
Rehabilitation therapy is primarily for restoration of body functions and may contain one or several categories of services. If a formal rehabilitative therapy service is included in a project, the facilities and equipment shall be as necessary for the effective function of the program. Where two or more rehabilitative services are included, items may be shared, as appropriate.

7.~~13.~~.16.B. Common Elements
Each rehabilitation~~ve~~ therapy department shall include the following, which may be shared or provided as separate units for each service:

7.~~13.~~.16.B1. Office and clerical space with provision for filing and retrieval of patient records.

7.~~13.~~.16.B2. Reception and control station(s) with visual control of waiting and activities areas. (This may be combined with office and clerical space.)

7.~~13.~~.16.B3. Patient waiting area(s) out of traffic with provision for wheelchairs.

7.~~13.~~.16.B4. Patient toilets with handwashing stations accessible to wheelchair patients.

7.~~13.~~.16.B5. Space(s) for storing wheelchairs and stretchers out of traffic while patients are using the services. These spaces may be separate from the service area but must be conveniently located.

7.~~13.~~.16.B6. A conveniently accessible housekeeping room and service sink for housekeeping use.

7.~~13.~~.16.B7. Locking closets or cabinets within the vicinity of each work area for securing staff personal effects.

7.~~13.~~.16.B8. Convenient access to toilets and lockers.

7.~~13.~~.16.B9. Access to a demonstration/conference room.

7.~~13.~~.16.C. Physical Therapy
If physical therapy is part of the service, the following, at least, shall be ~~included~~provided:

7.~~13.~~.16.C1. Individual treatment area(s) with privacy screens or curtains. Each such space shall have not less than 70 square feet (6.51 square meters) of clear floor area.

7.~~13.~~.16.C2. Handwashing stations for staff either within or at each treatment space. ~~(One handwashing station may serve several treatment stations.)~~Each treatment room shall have at least one handwashing station.

7.~~13.~~.16.C3. Exercise area and facilities.

7.~~13.~~.16.C4. Clean linen and towel storage.

7.~~13.~~.16.C5. Storage for equipment and supplies.

7.~~13.~~.16.C6. Separate storage for soiled linen, towels, and supplies.

7.~~13.~~.16.C7. If required by the functional program, patient dressing areas, showers, and lockers. ~~These~~ They shall be accessible and usable by the disabled.

7.~~13.~~.16.C8. If required by the functional program, ~~P~~provisions ~~shall be made~~ for thermotherapy, diathermy, ultrasonics, and hydrotherapy ~~when required by the functional program~~.

7.~~13.~~.16.D. Occupational Therapy
If ~~this~~ occupational therapy is part of the service ~~is provided~~, the following, at least, shall be provided~~included~~:

7.~~13.~~.16.D1. Work areas and counters suitable for wheelchair access.

7.~~13.~~.16.D2. Handwashing stations.

7.~~13.~~.16.D3. Storage for supplies and equipment.

***7.~~13.~~.16.D4.** An area for teaching daily living activities ~~shall be provided~~. It shall contain an area for a bed, kitchen counter with appliances and sink, bathroom, and a table/chair.

7.~~13.~~.16.E. Prosthetics and Orthotics
If ~~this~~ prosthetics and orthotics is part of the service ~~is provided~~, the following, at least, shall be

~~included~~provided:

7.~~13.~~.16.E1. Workspace for technicians.

7.~~13.~~.16.E2. Space for evaluating and fitting, with provision for privacy.

7.~~13.~~.16.E3. Space for equipment, supplies, and storage.

7.~~13.~~.16.F. Speech and Hearing
If ~~this~~ speech and hearing is part of the service is ~~provided~~, the following, at least, shall be ~~included~~provided:

7.~~13.~~.16.F1. Space for evaluation and treatment.

7.~~13.~~.16.F2. Space for equipment and storage.

7.~~14~~17 Renal Dialysis Unit (Acute and Chronic)

7.~~14.~~.17.A. General

7.~~14.~~.17.A1. ~~The number of dialysis stations shall be based upon the expected workload and may include several work shifts per day.~~Equipment and space shall be provided as necessary to meet the functional program.

7.~~14.~~.17.A2. The location shall offer convenient access for outpatients. Accessibility to the unit from parking and public transportation shall be a consideration.

7.~~14.~~.17.A3. Space and equipment shall be provided as necessary to accommodate the functional programs, which may include acute (inpatient ~~services~~) and chronic cases, home treatment, and kidney dialyzer reuse facilities. Inpatient services ~~(acute) may be performed~~are permitted in critical care units and designated areas in the hospital, with appropriate utilit~~y~~ies.

7.~~14.~~.17.B. Treatment Area

7.~~14.~~.17.B1. The treatment area may be an open area and shall be separate from administrative and waiting areas.

7.~~14.~~.17.B2. Nurse's station(s) shall be located within the dialysis treatment area and designed to provide visual observation of all patient stations.

7.~~14.~~.17.B3. Individual patient treatment areas shall contain at least 80 square feet (7.44 square meters). The 80 square feet (7.44 square meters) shall be exclusive of general circulation space within the ward. There shall be at least a 4-foot (1.22 meters) space between beds and/or lounge chairs.

7.~~14.~~.17.B4. Handwashing stations shall be convenient to the nurses station and patient treatment areas. There shall be at least one handwashing station serving no more than four stations. The~~se~~ handwashing stations shall be uniformly distributed to provide equal access from each patient station.

7.~~14.~~.17.B5. The open unit shall be designed to provide privacy for each patient.

7.14..17.B6. The number of and need for required airborne infection isolation rooms shall be determined by an Infection Control Risk Assessment (ICRA). When required, the airborne infection isolation room(s) shall comply with the requirements of Section 7.2.C.

7.14..17.B7. If required by the functional program, there shall be a medication dispensing station for the dialysis center. A work counter and handwashing stations shall be included in this area. Provisions shall be made for the controlled storage, preparation, distribution, and refrigeration of medications.

7.14..17.B8. If home training is provided in the unit, a private treatment area of at least 120 square feet (11.15 square meters) shall be provided for patients who are being trained to use dialysis equipment at home. This room shall contain a counter, handwashing stations, and a separate drain for fluid disposal.

7.14..17.B9. An examination room with handwashing stations and writing surface shall be provided with at least 100 square feet (9.29 square meters).

7.14..17.B10. A clean workroom shall be provided. If the room is used for preparing patient care items, it shall contain a work counter, a handwashing station, and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and handwashing station may be omitted. Soiled and clean workrooms or holding rooms shall be separated and have no direct connection.

7.14..17.B11. A soiled workroom shall be provided and contain a flushing-rim sink, handwashing station, work counter, storage cabinets, waste receptacles, and a soiled linen receptacle.

7.14..17.B12. If dialyzers are reused, a reprocessing room is required and sized to perform the functions required shall be provided. and This room shall include a one-way flow of materials from soiled to clean with provisions for a refrigeration (temporary storage or dialyzer), decontamination/cleaning areas, sinks, processors, computer processors and label printers, packaging area, and dialyzer storage cabinets.

7.14..17.B13. If a nourishment station for the dialysis service is provided, the nourishment station shall contain a sinkhandwashing station, a work counter, a refrigerator, storage cabinets, a water-dispensing unit separate from the handwashing station, and equipment for serving nourishments as required. The nourishment station shall be located away from the treatment area to prevent the risk of cross-contamination.

7.14..17.B14. An environmental services closet shall be provided adjacent to and for the exclusive use of the unit. The closet shall contain a floor receptor or service sink and storage space for housekeeping supplies and equipment. Water supply and drain connection for testing machines shall be provided.

7.17.B15. If a stat laboratory for blood and urinalysis is provided, the stat laboratory shall contain a handwashing station, work counters, storage spaces, an undercounter refrigerator for specimens, and a cup sink. An area for the phlebotomists' use shall be provided adjacent to the laboratory. A pass-through for specimens shall be provided between the lavatory and the laboratory.

7.14..17.B156. If required by the functional program, an equipment repair and breakdown room shall be equipped with a handwashing station, deep service sink, work counter, and storage cabinet.

7.14..17.B167. Supply areas or supply carts shall be provided.

7.14..17.B178. If stretchers are provided, Sstorage space shall be available for wheelchairs and stretchers, if stretchers are provided, out of direct line of traffic.

7.14..17.B189. A clean linen storage area shall be provided. This It may be within the clean workroom, a separate closet, or an approved distribution system. If a closed cart system is used, storage may be in an alcove. It must be out of the path of normal traffic and under staff control.

7.14..17.B1920. Each facility using a central batch delivery system shall provide, either on the premises or through written arrangements, individual delivery systems for the treatment of any patient requiring special dialysis solutions. The mixing room shouldshall also include a sink, storage space, and holding tanks.

7.14..17.B201. The water treatment equipment shall be located in an enclosed room.

7.14..17.B212. A patient toilet with handwashing stations shall be provided.

***7.14..17.B223.** Piping. Design consideration shall be given to the disposal of liquid waste from the dialyzing process to prevent odor and backflow.

***7.17.B24.** Temperature and humidity.

7.14..17.C. Ancillary Facilities

7.14..17.C1. Appropriate staff clothing change areas and lounge areas shall be available for male and female personnel for staff clothing change area and lounge. The areas shall contain lockers, shower, toilet, and handwashing stations.

7.14..17.C2. Storage for patients' belongings shall be provided.

7.14..17.C3. A waiting room, toilet room with handwashing stations, drinking fountain, public telephone, and seating accommodations for waiting periods shall be available or accessible to the dialysis unit.

7.14..17.C4. Office and clinical work space shall be available for administrative services.

7.17.C6. If required by the functional program, a laboratory space, including counters, sinks, cabinets, label machines, computers, and handwashing sinks, shall be provided to accommodate processing of blood draws and urine samples.

7.15 18 Respiratory Therapy Service

The type and extent of respiratory therapy service in different institutions vary greatly. In some, therapy is delivered in large sophisticated units, centralized in a specific area; in others, basic services are provided only at patients' bedsides. If respiratory service is provided, the following elements shall be included provided as a minimum, in addition to those elements stipulated in Sections 7.13..16.B1, 7, 8, and 9:

7.15..18.A. Storage for Equipment and Supplies

7.15..18.B. Space and Utilities for Cleaning and Disinfecting Equipment

~~Provide physical separation of t~~The space for receiving and cleaning soiled materials shall be physically separated from the space for storage of clean equipment and supplies. Appropriate local exhaust ventilation shall be provided if gluteraldehyde or other noxious disinfectants are used in the cleaning process.

~~**7.15.C.**~~
~~Respiratory services shall be conveniently accessible on a 24-hour basis to the critical care units.~~

7.~~15.~~.18.~~D~~C. Outpatient Testing and Demonstration
If respiratory services such as testing and demonstration for outpatients are part of the program, additional facilities and equipment shall be provided as necessary for the appropriate function of the service, including but not limited to:

7.~~15.~~.18.~~D~~C1. Patient waiting area with provision for wheelchairs.

7.~~15.~~.18.~~D~~C2. A reception and control station.

7.~~15.~~.18.~~D~~C3. Patient toilets and handwashing stations.

7.~~15.~~.18.~~D~~C4. Room(s) for patient education and demonstration.

7.~~15.~~.18.~~E~~D. Cough-Inducing and Aerosol-Generating Procedures
All cough-inducing procedures performed on patients who may have infectious *Mycobacterium tuberculosis* shall be performed in rooms using local exhaust ventilation devices~~,~~ (e.g., booths or special enclosures with discharge HEPA filters and exhaust directly to the outside). If a ventilated booth is used, the air exchange rate within the booth shall be at least 12 air changes per hour, with a minimum exhaust flow rate of 50 cfm and differential pressure of 0.0l" w.c. (2.5 Pa). These procedures may also be performed in a room that meets the ventilation requirements for airborne infection control. See Table 7.2 for airborne infection isolation room ventilation requirements.

7.~~16~~19 Morgue

These facilities shall be accessible through an exterior entrance and shall be located to avoid the need for transporting bodies through public areas.

7.~~16.~~.19.A.
If autopsies are performed in the hospital, ~~T~~the following elements shall be provided ~~when autopsies are performed in the hospital~~:

7.~~16.~~.19.A1. Refrigerated facilities for body holding. Body-holding refrigerators shall be equipped with temperature-monitoring and alarm singnals.

7.~~16.~~.19.A2. An autopsy room containing the following:

a. A work counter with a ~~sink equipped for~~ handwashing station.

b. A storage space for supplies, equipment, and specimens.

c. An autopsy table.

d. A deep sink for washing ~~of~~ specimens.

7.~~16.~~.19.A3. A housekeeping service sink or receptor for cleanup and housekeeping.

***7.~~16.~~.19.B.**
If autopsies are performed outside the facility, a well-ventilated, temperature-controlled~~,~~ body-holding room shall be provided.

7.~~17~~20 Pharmacy

7.~~17.~~.20.A. General
The size and type of services to be provided in the pharmacy will depend upon the type of drug distribution system used, number of patients to be served, and extent of shared or purchased services. ~~This~~ These factors shall be described in the functional program. The pharmacy room or suite shall be located for convenient access, staff control, and security. Facilities and equipment shall be as necessary to accommodate the function~~s of the~~al program. (Satellite facilities, if provided, shall include those items required by the program.) As a minimum, the following elements shall be ~~included~~provided:

7.~~17.~~.20.B. Dispensing

7.~~17.~~.20.B1. A pickup and receiving area.

7.~~17.~~.20.B2. An area for reviewing and recording.

***7.~~17.~~.20.B3.** An extemporaneous compounding area that includes a sink and sufficient counter space for drug preparation. ~~Floor drainage may also be required, depending on the extent of compounding conducted.~~

7.~~17.~~.20.B4. Work counters and space for automated and manual dispensing activities.

7.~~17.~~.20.B5. An area for temporary storage, exchange, and restocking of carts.

7.~~17.~~.20.B6. Security provisions for drugs and personnel in the dispensing counter area.

7.20.B7. A room for receiving, breakout, and inventory control of materials used in the pharmacy shall be provided.

7.~~17.~~.20.C. Manufacturing

7.~~17.~~.20.C1. A bulk compounding area.

7.~~17.~~.20.C2. Provisions for packaging and labeling.

7.~~17.~~.20.C3. A quality-control area.

7.~~17.~~.20.D. Storage
~~Storage (may be c~~Cabinets, shelves, and/or separate rooms or closets~~)~~.

7.~~17.~~.20.D1. Bulk storage.

7.~~17.~~.20.D2. Active storage.

7.~~17.~~.20.D3. Refrigerated storage.

7.~~17.~~.20.D4. Volatile fluids and alcohol storage constructed according to applicable fire safety codes for the substances involved.

7.~~17.~~.20.D5. Secure storage for narcotics and controlled drugs.

7.~~17.~~.20.D6. Storage for general supplies and equipment not in use.

7.~~17.~~.20.E. Administration

7.~~17.~~.20.E1. Provision for cross-checking of medication and drug profiles of individual patients.

7.~~17.~~.20.E2. Poison control, reaction data, and drug information centers.

7.~~17.~~.20.E3. A separate room or area for office function~~s.,~~ This room shall include space to accommodate a~~ing~~ desk, filing capabilities, communication equipment, and reference materials.

7.~~17.~~.20.E4. Provisions for patient counseling and instruction (may be in a room separate from the pharmacy).

7.~~17.~~.20.E5. A room for education and training (may be ~~in~~ a multipurpose room shared with other departments).

7.~~17.~~.20.F. Other

7.~~17.~~.20.F1. Handwashing stations ~~shall be provided~~ within each separate room where open medication is handled.

7.~~17.~~.20.F2. ~~Provide for c~~Convenient access to toilet and locker.

7.~~17.~~.20.F3. If unit dose procedure is used, ~~provide~~ additional space and equipment for supplies, packaging, labeling, and storage, as well as for the carts.

7.~~17.~~.20.F4. If intravenous (IV) solutions are prepared in the pharmacy, ~~provide~~ a sterile work area with a laminar-flow workstation designed for product protection. The laminar-flow system shall include a nonhydroscopic filter rated at 99.97 percent (HEPA), as tested by dioctyl~~-~~phtalate (DOP) tests, and have a visible pressure gauge for detection of filter leaks or defects.

7.~~17.~~.20.F5. ~~Provide for consultation and patient education when~~ If the functional program requires dispensing of medication to outpatients, an area for consultation and patient education.

7.~~18~~21 Dietary Facilities

***7.~~18.~~.21.A. General**

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

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

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

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

7~~.18.~~.21.B. Functional Elements
If on-site conventional food service preparation is used, the following shall be provided, in size and number appropriate for the functional program~~approved function shall be provided~~:

7~~.18.~~.21.B1. Receiving/control stations. ~~Provide a~~An area for ~~the~~ receiving and control of incoming dietary supplies shall be provided. This area shall be separated from the general receiving area and shall contain ~~the following:~~ a control station and a breakout for loading, uncrating, and weighing supplies.

7~~.18.~~.21.B2. Storage spaces. They shall be convenient to the receiving area and shall be accessible without traveling ~~located to exclude traffic~~ through the food preparation area ~~to reach them~~. Storage spaces for bulk, refrigerated, and frozen foods shall be provided. A minimum of four days' supplies shall be stocked. ~~(In remote areas, this number may be increased to accommodate length of delivery in emergencies.)~~

Food storage components shall be grouped for convenient access from receiving and to the food preparation areas.

All food shall be stored clear of the floor. Lowest shelf shall be not less than 12 inches (300 millimeters) above the floor or shall be closed in and sealed tight for ease of cleaning.

7~~.18.~~.21.B3. Cleaning supplies storage. ~~Provide a~~A separate storage room shall be provided for the storage of non-food items such as cleaning supplies that might contaminate edibles.

7~~.18.~~.21.B4. Additional storage rooms. They shall be provided as necessary for the storage of cooking wares, extra trays, flatware, plastic and paper products, and portable equipment.

7~~.18.~~.21.B5. Food preparation work spaces. ~~Provide w~~Work spaces shall be provided for food preparation, cooking, and baking. These areas shall be as close as possible to the user (i.e., tray assembly and dining). ~~Provide a~~Additional spaces shall be provided for thawing and portioning.

7~~.18.~~.21.B6. Assembly and distribution. ~~Provide a~~A patient tray assembly area ~~and~~ shall be ~~locate within~~ close ~~proximity~~ to the food preparation and distribution areas.

7~~.18.~~.21.B7. Food service carts. A cart distribution system shall be provided, with spaces for storage, loading, distribution, receiving, and sanitizing of the food service carts. The cart traffic shall be designed to eliminate any danger of cross-circulation between outgoing food carts and incoming, soiled carts, and

the cleaning and sanitizing process. Cart circulation shall not be through food processing areas.

7.18..21.B8. Dining area. Provide dDining space(s) shall be provided for ambulatory patients, staff, and visitors. These spaces shall be separate from the food preparation and distribution areas.

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

7.18..21.B10. Area for receiving, scraping, and sorting soiled tableware. They shall be adjacent to ware washing and separate from food preparation areas.

7.18..21.B11. Ware-washing facilities. They shall be designed to prevent contamination of clean wares with soiled wares through cross-traffic. The clean wares shall be transferred for storage or use in the dining area without having to pass through food preparation areas.

7.18..21.B12. Pot-washing facilities. These shall include ing multi-compartmented sinks of adequate size for the intended use, shall be provided convenient to the using service. Supplemental heat for hot water to clean pots and pans may shall be by booster heater, or by steam jet, or other appropriate means.

Mobile carts or other provisions should shall be made for drying and storage storing of pots and pans.

7.18..21.B13. Waste storage room. A food waste storage room shall be conveniently located convenient to the food preparation and ware-washing areas but not within the food preparation area. It shall have direct access to the hospital's waste collection and disposal facilities.

7.18..21.B14. Handwashing stations. Hands-free Fixtures that are operable without the use of handshandwashing stations shall be located conveniently accessible at locations throughout the unit.

7.18..21.B15. Office spaces. Offices for the use of the food service manager shall be provided. In smaller facilities, this space may be located in an area that is part of the food preparation area.

7.18..21.B16. Toilets, and lockers, and lounges spaces. Toilets, lockers and lounge facilities shall be convenient to the dietary department. These facilities may be shared with adjacent services provided that they are adequately sized.
Spaces shall be provided for the exclusive use of the dietary staff. They shall not open directly into the food preparation areas, but must be in close proximity to them.

7.18..21.B17. Housekeeping rooms. They shall be provided for the exclusive use of the dietary department and shall contain the following: a floor sink and space for mops, pails, and supplies. Where hot water or steam is used for general cleaning, additional space within the room shall be provided for the storage of hoses and nozzles.

7.18..21.B18. Ice-making equipment. It This shall be of type that is convenient for service and easily cleaned. It shall be provided for both drinks and food products (self-dispensing equipment), and for general use (storage-bin type equipment).

7.~~18..~~21.B19. Facilities for ~~C~~commissary or contract services from other areas. ~~Items above may be reduced as appropriate.~~ Provision~~de for~~ shall be made to protect~~ion of~~ food delivered to ~~i~~ensure freshness, ~~retention of~~retain hot and cold, and avoid~~ance of~~ contamination. If delivery is from outside sources, ~~provide~~ protection against weather shall be provided. Provision~~s~~ ~~must~~ shall be made for thorough cleaning and sanitizing of equipment to avoid mix~~ing of~~ soiled and clean equipment.

7.~~18..~~21.C. Equipment
Mechanical devices shall be heavy duty, suitable for use intended, and easily cleaned. Where equipment is movable , ~~provide~~ heavy-~~-~~duty locking casters shall be provided. If equipment is to have fixed utility connections, the equipment ~~should~~ shall not be equipped with casters. Walk-in coolers, refrigerators, and freezers shall be insulated at floor as well as at walls and top. Coolers and refrigerators shall be capable of maintaining a temperature down to freezing. Freezers shall be capable of maintaining a temperature of 20 degrees below 0~~-~~° F. Coolers, refrigerators, and freezers shall be thermostatically controlled to maintain desired temperature settings in increments of 2 degrees or less. Interior temperatures shall be indicated digitally so as to be visible from the exterior. Controls shall include audible and visible high and low temperature alarm. Time of alarm shall be automatically recorded.

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

All cooking equipment shall be equipped with automatic shutoff devices to prevent excessive heat buildup.

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

7.~~19~~22 Administration and Public Areas

The following shall be provided:

7.~~19..~~22.A. Entrance
This shall be at grade level, sheltered from inclement weather, and accessible to the disabled.

7.~~19..~~22.B. Lobby
This shall include:

7.~~19..~~22.B1. A counter or desk for reception and information.

7.~~19..~~22.B2. Public waiting area(s).

7.~~19..~~22.B3. Public toilet facilities.

7.~~19..~~22.B4. Public telephones.

7.~~19..~~22.B5. Drinking fountain(s).

7.~~19..~~22.C. Interview Space(s)
These shall include provisions for private interviews relating to social service, credit, and admissions.

7.19.22.D. Admissions Area
If required by the functional program for initial admission of inpatients, the area shall include:

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

7.19.22.D2. A work counter or desk for staff.

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

7.19.22.E. General or Individual Office(s)
These shall be provided for business transactions, medical and financial records, and administrative and professional staff.

7.19.22.F. Multipurpose Room(s)
These shall be provided for conferences, meetings, and health education purposes, and shall include provisions for the use of visual aids. One multipurpose room may be shared by several services.

7.19.22.G. Storage for Office Equipment and Supplies

7.22.H. Public Waiting Areas. All public waiting areas serving more than 15 people shall include toilet room(s) equipped with handwashing stations. These toilet rooms shall be located near the waiting areas and may serve more than one such area.

7.2023 Medical Records

Rooms, areas, or offices for the following personnel and/or functions shall be provided:

7.20.23.A. Medical Records Administrator/Technician

7.20.23.B. Review and Dictation

7.20.23.C. Sorting, Recording, or Microfilming Records

7.20.23.D. Record Storage

7.21 24 Central Services

The following shall be provided:

7.21.24.A. Separate Soiled and Clean Work Areas
7.21.24.A1. Soiled workroom. This room shall be physically separated from all other areas of the department. Work space ~~should~~ shall be provided to handle the cleaning and initial sterilization/disinfection of all medical/surgical instruments and equipment. Work tables, sinks, flush-type devices, and washer/sterilizer decontaminators shall be provided. Pass-through doors and washer/sterilizer decontaminators ~~should~~ shall deliver into clean processing area/workrooms.

***7.21.24.A2.** Clean assembly/workroom. This workroom shall contain handwashing stations, work space, and equipment for terminal sterilizing of medical and surgical equipment and supplies. Clean and

soiled work areas ~~should~~ shall be physically separated.

7~~.21..~~24.B. Storage Areas

7~~.21..~~24.B1. Clean/sterile medical/surgical supplies. A room for breakdown ~~should~~ shall be provided for manufacturers' clean/sterile supplies. ~~(~~The clean processing area ~~should~~ shall not be in this area but in an adjacent space~~)~~. Storage for packs, etc., shall include provisions for ventilation, humidity, and temperature control.

7~~.21..~~24.C. Administrative/Changing Room
If required by the functional program, this room ~~should~~ shall be separate from all other areas and provide for staff to change from street clothes into work attire. Lockers, ~~sink~~handwashing station, and showers ~~should~~ shall be made available within the immediate vicinity of the department.

7~~.21..~~24.D. Storage Room for Patient Care and Distribution Carts
This area ~~should~~ shall be adjacent~~,~~ and easily available to clean and sterile storage~~,~~ and close to the main distribution point to keep traffic to a minimum and ease ~~of~~ work flow.

7.~~22~~25 General Stores

In addition to supply facilities in individual departments, a central storage area shall ~~also~~ be provided. General stores may be located in a separate building on-site with provisions for protection against inclement weather during transfer of supplies.

The following shall be provided:

7~~.22..~~25.A. Off-street Unloading Facilities

7~~.22..~~25.B. Receiving Area
Adequate receiving areas shall be provided to accommodate delivery trucks and other vehicles. Dock areas shall be segregagedfrom other occupied building areas and located so that noise and odors from operation will not adversely affect building occupants. The receiving area shall be convenient to service elevators and other internal corridor systems to promote the safe, secure, and efficient movement of arriving materials without compromising patient areas. Receiving areas shall be segregated from waste staging and other outgoing materials handling functions.

7.25.B1. Adequate space shall be provided to enable breakdown, sorting, and staging of incoming materials and supplies. Balers and other devices shall be located to capture packaging for recycling or return to manufacturer/ deliverer.

7.25.B2. In facilities with centralized warehousing, adequate space shall be provided at receiving points to permit the staging of reusable transport containers for supplies moving from central warehouses to individual receiving sites.

7~~.22..~~25.C. General Storage Room(s)
General storage room(s) with a total area of not less than 20 square feet (1.86 square meters) per inpatient bed shall be provided. Storage may be in separate, concentrated areas within the institution or in one or more individual buildings on-site. A portion of this storage may be provided off-site.

7.~~22.~~.25.D. Additional Storage Room(s)
Additional storage areas for outpatient facilities shall be provided in an amount not less than 5 percent of the total area of the outpatient facilities. This may be combined with and in addition to the general stores or be located in a central area within the outpatient department. A portion of this storage may be provided off-site.

7.~~23~~26 Linen Services

7.~~23.~~.26.A. General
Each facility shall have provisions for storing and processing of clean and soiled linen for appropriate patient care. Processing may be done within the facility, in a separate building on- or off-site, or in a commercial or shared laundry.

7.~~23.~~.26.B. Internal Processing
Facilities and equipment shall be as required for cost~~-~~-effective operation as described in the functional program. At a minimum, the following elements shall be ~~included~~provided:

7.~~23.~~.26.B1. A separate room for receiving and holding soiled linen until ready for pickup or processing.

7.~~23.~~.26.B2. A central, clean linen storage and issuing room(s), in addition to the linen storage required at individual patient units.

7.~~23.~~.26.B3. Cart storage area(s) for separate parking of clean- and soiled-linen carts out of traffic.

7.~~23.~~.26.B4. A clean linen inspection and mending room or area. If not provided elsewhere, a clean linen inspection, delinting, folding, assembly , and packaging area ~~should~~ shall be provided as part of the linen services. Mending ~~should~~ shall be provided for in the linen services department. A space for tables, shelving, and storage ~~should~~ shall be provided.

7.~~23.~~.26.B5. Handwashing stations in each area where unbagged, soiled linen is handled.

7.~~23.~~.26.C. Outside Processing
If linen is processed outside the building, provisions shall also be made for:

7.~~23.~~.26.C1. A service entrance, protected from inclement weather, for loading and unloading of linen.

7.~~23.~~.26.C2. Control station for pickup and receiving.

7.~~23.~~.26.D. Laundry Facility
If linen is processed in a laundry facility that is part of the project (within or as a separate building), the following shall be provided in addition to ~~that~~ the requirements of Section 7.~~23.~~.26B:

7.~~23.~~.26.D1. A receiving, holding, and sorting room for control and distribution of soiled linen. Discharge from soiled linen chutes ~~may~~ shall be received ~~within this room or~~ in a separate room adjacent to it.

7.~~23.~~.26.D2. Laundry processing room with commercial or industrial~~-~~type equipment that can process at least a seven-day supply within the regular scheduled work week. This may require a capacity for processing a seven-day supply in a 40-hour week.

7.~~23.~~.26.D3. Storage for laundry supplies.

7.~~23.~~.26.D4. Employee handwashing stations in each room where clean or soiled linen is processed and handled.

7.~~23.~~.26.D5. Arrangement of equipment that will permit an orderly work flow and minimize cross-traffic that might mix clean and soiled operations.

7.~~23.~~.26.D6. Conveniently accessible staff lockers, showers, and lounge.

7.~~24~~25 Facilities for Cleaning and Sanitizing Carts

Facilities shall be provided to clean and sanitize carts serving the central service department, dietary facilities, and linen services. These facilities may be centralized or departmentalized.

7.~~25~~28 Employee Facilities

Lockers, lounges, toilets, etc. ~~should~~ shall be provided for employees and volunteers. These ~~should~~ shall be in addition to, and separate from, those required for medical staff and public.

7.~~26~~ 29 Housekeeping Rooms

In addition to the housekeeping rooms required in certain departments, sufficient housekeeping rooms shall be provided throughout the facility ~~as required~~ to maintain a clean and sanitary environment. Each shall contain a floor receptor or service sink and storage space for housekeeping equipment and supplies. There shall not be less than one housekeeping room for each floor.

7.~~27~~30 Engineering Service and Equipment Areas

Sufficient space shall be included in all mechanical and electrical equipment rooms for proper maintenance of equipment. Provisions shall also be made for removal and replacement of equipment. The following shall be provided:

7.~~27.~~.30.A.
Room(s) or separate building(s) for boilers, mechanical, and electrical equipment, *except*:

7.~~27.~~.30.A1. Roof-top air conditioning and ventilation equipment installed in weatherproof housings.

7.~~27.~~.30.A2. Standby generators where the engine and appropriate accessories (i.e., batteries) are properly heated and enclosed in a weatherproof housing.

7.~~27.~~.30.A3. Cooling towers and heat rejection equipment.

7.~~27.~~.30.A4. Electrical transformers and switchgear where required to serve the facility and where installed in a weatherproof housing.

7.~~27.~~.30.A5. Medical gas parks and equipment.

7.~~27.~~.30.A6. Air-cooled chillers where installed in a weatherproof housing.

7.~~27.~~30.A7. Trash compactors and incinerators.

7.30.A8. Site lighting, post indicator valves, and other equipment normally installed on the exterior of the building.

7.30.A9. Where required in new construction, fire pumps and ancillary equipment shall be separated from other functions by construction having a 2-hour fire resistance rating. The fire pump shall be installed in a readily accessible location with direct access from the exterior.

7.~~27.~~30.B.
Engineer's office with file space and provisions for protected storage of facility drawings, records, manuals, etc.

7.~~27.~~30.C.
General maintenance shop(s) for repair and maintenance.

7.~~27.~~30.D.
Storage room for building maintenance supplies. Storage for solvents and flammable liquids shall comply with applicable NFPA codes.

7.~~27.~~30.E.
Separate area or room specifically for storage, repair, and testing of electronic and other medical equipment. The amount of space and type of utilities will vary with the type of equipment involved and types of outside contracts used.

7.~~27.~~30.F.
Yard equipment and supply storage areas, ~~shall be~~ located so that equipment may be moved directly to the exterior without interference with other work.

7.~~28~~31 General Standards for Details and Finishes

If approved by the authorities having jurisdiction, retained portions of existing facilities that are not required to be totally modernized due to financial or other hardships may, as a minimum, comply with applicable requirements of the Existing Health Care Occupancies Section of NFPA 101. However, a plan of correction for these portions should also be developed and implemented.

Details and finishes in new construction projects, including additions and alterations, shall comply with the following (see Section 1.2 concerning existing facilities where total compliance is structurally impractical):

7.~~28.~~31.A. Details

7.~~28.~~31.A1. Compartmentation, exits, fire alarms, automatic extinguishing systems, and other fire prevention and fire protection measures, including those within existing facilities, shall comply with NFPA 101, with the following stipulation. The Fire-Safety Evaluation System (FSES) is permitted, subject to AHJ approval, in new construction and renovation~~shall not be used as a substitute for basic NFPA 101 design criteria for new construction or major renovations in existing facilities~~. (The FSES is intended as an evaluation tool for fire safety only.) See Section 1.6 for exceptions.

Note: For most projects it is essential that third-party reimbursement requirements also be followed. Verify where these may be in excess of standards in these Guidelines.

7.~~28.~~.31.A2. Corridors in outpatient suites and in areas not commonly used for patient bed or stretcher transportation may be reduced in width to 5 feet (1.52 meters).

7.~~28.~~.31.A3. Location of items such as drinking fountains, telephone booths, vending machines, and portable equipment shall not restrict corridor traffic or reduce the corridor width below the minimum standard.

7.~~28.~~.31.A4. Rooms that contain bathtubs, sitz baths, showers, and/or water closets for inpatient use shall be equipped with doors and hardware permitting emergency access from the outside. When such rooms have only one opening or are small, the doors shall open outward or in a manner that will avoid pressing a patient who may have collapsed within the room. Similar considerations may be desirable for certain outpatient services.

7.~~28.~~.31.A5. If required by the functional program, door hardware on patient toilet rooms in psychiatric nursing units may be designed to allow staff to control access.

7.~~28.~~.31.A6. The minimum door size for inpatient bedrooms in new work shall be 3 feet 8 inches (1.11 meters) wide and 7 feet (2.13 meters) high to provide clearance for movement of beds and other equipment. Existing doors of not less than 2 feet 10 inches (863.6 millimeters) wide may be considered for acceptance where function is not adversely affected and replacement is impractical. Doors to other rooms used for stretchers (including hospital wheeled-bed stretchers) and/or wheelchairs shall have a minimum width of 2 feet 10 inches (863.6 millimeters). Where used in these Guidelines, door width and height shall be the nominal dimension of the door leaf, ignoring projections of frame and stops. **Note**: While these standards are intended for access by patients and patient equipment, size of office furniture, etc., shall also be considered.

7.~~28.~~.31.A7. All doors between corridors, rooms, or spaces subject to occupancy, except elevator doors, shall be of the swing type. Manual or automatic sliding doors may be exempt from this standard where fire and other emergency exiting requirements are not compromised and where cleanliness of surfaces can be maintained.

7.~~28.~~.31.A8. Doors, except those to spaces such as small closets not subject to occupancy, shall not swing into corridors in a manner that might obstruct traffic flow or reduce the required corridor width. (Large walk-in-type closets are considered inhabitable spaces.)

7.~~28.~~.31.A9. Windows and outer doors that frequently may be left open shall be equipped with insect screens.

7.~~28.~~.31.A10. Operable windows are not required in patient rooms. If operable windows are provided in patient rooms or suites, operation of such windows shall be restricted to inhibit possible escape or suicide.

7.~~28.~~.31.A11. Glass doors, lights, sidelights, borrowed lights, and windows located within 12 inches (304.8 millimeters) of a door jamb (with a bottom-frame height of less than 60 inches or 1.52 meters above the finished floor) shall be constructed of safety glass, wired glass, or plastic, break-resistant material that creates no dangerous cutting edges when broken. Similar materials shall be used for wall

openings in active areas such as recreation and exercise rooms, unless otherwise required for fire safety. Safety glass-tempered or plastic glazing materials shall be used for shower doors and bath enclosures. Plastic and similar materials used for glazing shall comply with the flame-spread ratings of NFPA 101. Safety glass or plastic glazing materials, as noted above, shall also be used for interior windows and doors, including those in pediatric and psychiatric unit corridors. In renovation projects, only glazing within 18 inches (460 millimeters) of the floor must be changed to safety glass, wire glass, or plastic, break-resistant material.

Note: Provisions of this paragraph concern safety from hazards of breakage. NFPA 101 contains additional requirements for glazing in exit corridors, etc., especially in buildings without sprinkler systems.

7.~~28.~~.31.A12. Linen and refuse chutes shall meet or exceed the following standards:

a. Service openings to chutes shall comply with NFPA 101.

b. The minimum cross-sectional dimension of gravity chutes shall be 2 feet (609.6 millimeters).

c. Chute discharge into collection rooms shall comply with NFPA 101.

d. Chutes shall meet the provisions as described in NFPA 82.

7.~~28.~~.31.A13. Thresholds and expansion joint covers shall be flush with the floor surface to facilitate the use of wheelchairs and carts. Expansion and seismic joints shall be constructed to restrict the passage of smoke.

7.~~28.~~.31.A14. Grab bars shall be provided in all patient toilets, showers, bathtubs, and sitz baths at a wall clearance of 1-1/2 inches (38.1 millimeters). Bars, including those that are part of such fixtures as soap dishes, shall be sufficiently anchored to sustain a concentrated load of 250 pounds (113.4 kilograms).

7.~~28.~~.31.A15. Location and arrangement of fittings for handwashing stations shall permit their proper use and operation. Particular care ~~should~~ shall be given to the clearances required for blade-type operating handles.

7.~~28.~~.31.A16. Mirrors shall not be installed at handwashing stations in food preparation areas, nurseries, clean and sterile supply areas, scrub sinks, or other areas where asepsis control would be lessened by hair combing.

7.~~28.~~.31.A17. Provisions for hand drying shall be included at all handwashing stations except scrub sinks. These provisions shall be paper or cloth units enclosed to protect against dust or soil and to ~~i~~ensure single-unit dispensing. Hot air dryers are permitted provided that installation precludes possible contamination by recirculation of air.

7.~~28.~~.31.A18. Lavatories and handwashing stations shall be securely anchored to withstand an applied vertical load of not less than 250 pounds (113.4 kilograms) on the fixture front.

7.~~28.~~.31.A19. Radiation protection requirements for x-ray and gamma ray installations shall conform with NCRP Report Nos. 33 and 49 and all applicable local requirements. Provision shall be made for testing completed installations before use. All defects must be corrected before approval. Testing is to be

coordinated with local authorities to prevent duplication.

7.~~28.~~.31.A20. The minimum ceiling height shall be 7 feet 10 inches (2.39 meters), with the following exceptions:

a. Boiler rooms shall have ceiling clearances not less than 2 feet 6 inches (762 millimeters) above the main boiler header and connecting piping.

b. Ceilings in radiographic, operating, and delivery rooms, and other rooms containing ceiling-mounted equipment or ceiling-mounted surgical light fixtures, shall be of sufficient height to accommodate the equipment or fixtures and their normal movement.

c. Ceilings in corridors, storage rooms, and toilet rooms shall be not less than 7 feet 8 inches (2.34 meters) in height. Ceiling heights in small, normally unoccupied spaces may be reduced.

d. Suspended tracks, rails, and pipes located in the traffic path for patients in beds and/or on stretchers, including those in inpatient service areas, shall be not less than 7 feet (2.13 meters) above the floor. Clearances in other areas may be 6 feet 8 inches (2.03 meters).

e. Where existing structures make the above ceiling clearance impractical, clearances shall be as required to avoid injury to individuals up to 6 feet 4 inches (1.93 meters) tall.

f. Seclusion treatment rooms shall have a minimum ceiling height of 9 feet (2.74 meters).

7.~~28.~~.31.A21. Recreation rooms, exercise rooms, equipment rooms, and similar spaces where impact noises may be generated shall not be located directly over patient bed areas or delivery and operating suites, unless special provisions are made to minimize such noise.

7.~~28.~~.31.A22. Rooms containing heat-producing equipment, such as boiler or heater rooms or laundries, shall be insulated and ventilated to prevent the floor surface above and/or the adjacent walls of occupied areas from exceeding a temperature of 10^{o}F (6^{o}C) above ambient room temperature.

7.~~28.~~.31.A23. The noise reduction criteria shown in Table 7.1 shall apply to partitions, floors, and ceiling construction in patient areas.

7.~~28.~~.31.B. Finishes

7.~~28.~~.31.B1. Cubicle curtains and draperies shall be noncombustible or flame-retardant, and shall pass both the large- and small-scale tests of NFPA 701 when applicable.

7.~~28.~~.31.B2. Materials and certain plastics known to produce noxious gases when burned shall not be used for mattresses, upholstery, and other items insofar as practical. ~~(Typical "hard" floor coverings such as vinyl, vinyl composition, and rubber normally do not create a major fire or smoke problem.)~~

7.~~28.~~.31.B3. Floors in areas and rooms in which flammable anesthetic agents are stored or administered shall comply with NFPA 99.

7.~~28.~~.31.B4. Floor materials shall be easily cleanable and appropriately wear-resistant for the location. Floors in areas used for food preparation or food assembly shall be water-resistant. Floor surfaces,

including tile joints, shall be resistant to food acids. In all areas subject to frequent wet-cleaning methods, floor materials shall not be physically affected by germicidal cleaning solutions. Floors subject to traffic while wet (such as shower and bath areas, kitchens, and similar work areas) shall have a nonslip surface.

7.~~28.~~.31.B5. In new construction or major renovation work, the floors and wall bases of all operating rooms and any delivery rooms used for cesarean sections shall be monolithic and joint free. The floors and wall bases of kitchens, soiled workrooms, and other areas subject to frequent wet cleaning shall also be homogenous, but may have tightly sealed joints.

7.~~28.~~.31.B6. Wall finishes shall be washable. In the vicinity of plumbing fixtures, wall finishes shall be smooth and water-resistant.

In dietary and food preparation areas, wall construction, finish, and trim, including the joints between the walls and the floors, shall be free of insect- and rodent-harboring spaces.

In operating rooms, delivery rooms for cesarean sections, isolation rooms, and sterile processing rooms, wall finishes shall be free of fissures, open joints, or crevices that may retain or permit passage of dirt particles.

7.~~28.~~.31.B7. Floors and walls penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of rodents and insects. Joints of structural elements shall be similarly sealed.

7.~~28.~~.31.B8. Ceilings, including exposed structure in areas normally occupied by patients or staff in food preparation and food storage areas, shall be cleanable with routine housekeeping equipment. Acoustic and lay-in ceiling, where used, shall not interfere with infection control.

In dietary areas and in other areas where dust fallout may present a problem, ~~provide~~ suspended ceilings shall be provided.

Ceiling finishes in ~~semi~~restricted areas such as operating rooms (subject to documented review and acceptance of the hospital's medical and infection control staff) and semirestricted areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms, and minor surgical procedure rooms ~~must~~ shall be smooth, scrubbable, nonabsorptive, nonperforated, capable of withstanding cleaning with chemicals, and without crevices that can harbor mold and bacterial growth. If lay-in ceiling is provided, it shall be gasketed or clipped down to prevent the passage of particles from the cavity above the ceiling plane into the semirestricted environment. Perforated, tegular, serrated cut, or highly textured tiles are not acceptable.

~~Ceiling finishes in restricted areas such as operating rooms shall be monolithic, scrubbable, and capable of withstanding chemicals. Cracks or perforations in these ceilings are not allowed.~~

In psychiatric patient rooms, toilets, and seclusion rooms, the ceiling and air distribution devices, lighting fixtures, sprinkler heads, and other appurtenances shall be of a tamper-resistant type.

7.~~28.~~.31.B9. Rooms used for protective isolation and anterooms adjacent to rooms used for protective isolation shall ~~not~~ have seamless flooring with integral coved base~~carpeted floors and shall have monolithic ceilings~~.

7.~~29~~ 32 Design and Construction, Including Fire -Resistant Standards

7.29..32.A. Design
Every building and portion thereof shall be designed and constructed to sustain all live and dead loads, including seismic and other environmental forces, in accordance with accepted engineering practices and standards as prescribed by local jurisdiction or by one of the model building codes. (See Section 1.1.A.)

7.29..32.B. Construction
Construction shall comply with the applicable requirements of NFPA 101, the standards contained herein, and the requirements of authorities having jurisdiction. If there are no applicable local codes, one of the recognized model building codes shall be used (see Section 1.6).

Note: NFPA 101 generally covers fire/safety requirements only, whereas most model codes also apply to structural elements. The fire/safety items of NFPA 101 would take precedence over other codes in case of conflict. Appropriate application of each would minimize problems. For example, some model codes require closers on all patient doors. NFPA 101 recognizes the potential fire/safety problems of this requirement and stipulates that if closers are used for patient room doors, smoke detectors should also be provided within each affected patient room.

7.29..32.C. Freestanding Buildings
Separate freestanding buildings for the boiler plant, laundry, shops, general storage, or other nonpatient contact areas shall be built in accordance with applicable building codes for such occupancy.

7.29..32.D. Interior Finishes
Interior finishing materials shall comply with the flame-spread limitations and the smoke-production limitations indicated in NFPA 101. This requirement does not apply to minor quantities of wood or other trim (see NFPA 101) or to wall covering less than ~~four~~ 4 mil thick applied over a noncombustible base.

7.29..32.E. Insulation Materials
Building insulation materials, unless sealed on all sides and edges with noncombustible material, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 150 or less when tested in accordance with NFPA 255.

7.29..32.F. Provisions for Disasters
~~(~~See also Section 1.~~-~~5.~~)~~

7.29..32.F1. An emergency-radio communication system shall be provided in each facility. This system shall operate independently of the building's service and emergency power systems during emergencies. The system shall have frequency capabilities to communicate with state emergency communication networks. Additional communication capabilities ~~will be~~are required of facilities containing a formal community emergency-trauma service or other specialty services (such as regional pediatric critical care units) that utilize staffed patient transport units.

7.29..32.F2. Unless specifically approved, hospitals shall not be built in areas subject to damage or inaccessibility due to natural floods. Where facilities may be subject to wind or water hazards, provision shall be made to ensure continuous operation.

7.~~30~~ 33 Special Systems

7.30..33.A. General

7.~~30.~~.33.A1. Prior to acceptance of the facility, all special systems shall be tested and operated to demonstrate to the owner or his designated representative that the installation and performance of these systems conform to design intent. Test results shall be documented for maintenance files.

7.~~30.~~.33.A2. Upon completion of the special systems equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions, a parts lists, and complete procurement information including equipment numbers and descriptions. Operating staff persons shall also be provided with instructions for proper operation of systems and equipment. Required information shall include all safety or code ratings as needed.

7.~~30.~~.33.A3. Insulation shall be provided surrounding special system equipment to conserve energy, protect personnel, and reduce noise.

7.~~30.~~.33.B. Elevators

All hospitals having patient facilities (such as bedrooms, dining rooms, or recreation areas) or critical services (such as operating, delivery, diagnostic, or therapeutic) located on other than the grade-level entrance floor shall have electric or hydraulic elevators. Installation and testing of elevators shall comply with ANSI/ASME A17.1 for new construction and ANSI/ASME A17.3 for existing facilities. (See ASCE 7-93 for seismic design and control systems requirements for elevators.)

7.~~30.~~.33.B1. In the absence of an engineered traffic study, the following guidelines for number of elevators shall apply:

a. At least ~~one~~ two hospital-type elevators shall be installed ~~when~~ where 1 to 59 patient beds are located on any floor other than the main entrance floor.

b. At least two hospital-type elevators shall be installed ~~when~~ where 60 to 200 patient beds are located on floors other than the main entrance floor, or where the major inpatient services are located on a floor other than those containing patient beds. (Elevator service may be reduced for those floors providing only partial inpatient services.)

c. At least three hospital-type elevators shall be installed where 201 to 350 patient beds are located on floors other than the main entrance floor, or where the major inpatient services are located on a floor other than those containing patient beds. (Elevator service may be reduced for those floors that provide only partial inpatient services.)

d. For hospitals with more than 350 beds, the number of elevators shall be determined from a study of the hospital plan and the expected vertical transportation requirements.

***7.~~30.~~.33.B2.** Hospital-type elevator cars shall have inside dimensions that accommodate a patient bed with attendants. Cars shall be at least 5 feet 8 inches (1.73 meters) wide by 9 feet (2.74 meters) deep. Car doors shall have a clear opening of not less than 4 feet (1.22 meters) wide and 7 feet (2.13 meters) high. In renovations, existing elevators that can accommodate patient beds used in the facility will not be required to be increased in size.

Note: Additional elevators installed for visitors and material handling may be smaller than noted above, within restrictions set by standards for disabled access.

7.~~30.~~.33.B3. Elevators shall be equipped with a two-way automatic level-maintaining device with an accuracy of ± 1/4 inch (± 6.4 millimeters).

7.~~30.~~.33.B4. Each elevator, except those for material handling, shall be equipped with an independent keyed switch for staff use for bypassing all landing button calls and responding to car button calls only.

7.~~30.~~.33.B5. Elevator call buttons and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors. This is so that the light control feature will be overridden or disengaged should it encounter smoke at any landing.

7.~~30.~~.33.B6. Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this section as well as all applicable safety regulations and codes.

7.~~30.~~.33.C. Waste ~~Processing Services~~Management

~~**7.30.C1.** Storage and disposal. Facilities shall be provided for sanitary storage and treatment or disposal of waste using techniques acceptable to the appropriate health and environmental authorities. The functional program shall stipulate the categories and volumes of waste for disposal and shall stipulate the methods of disposal for each.~~

~~**7.30.C2.** Medical waste. Medical waste shall be disposed of either by incineration or other approved technologies. Incinerators or other major disposal equipment may be shared by two or more institutions.~~

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

~~b. Incinerators with 50 pounds per hour or greater capacities shall be in a separate room or outdoors; those with lesser capacities may be located in a separate area within the facility boiler room. Rooms and areas containing incinerators shall have adequate space and facilities for incinerator charging and cleaning, as well as necessary clearances for work and maintenance. Provisions shall be made for operation, temporary storage, and disposal of materials so that odors and fumes do not drift back into occupied areas. Existing approved incinerator installations, which are not in separate rooms or outdoors, may remain unchanged provided they meet the above criteria.~~

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

~~*d. Heat recovery.~~

~~*e. Environmental guidelines.~~

***7.33.C1.** Collection and storage. Waste collection and storage locations shall be determined by the facility as a component of the functional program. The functional program shall stipulate the categories and volumes of waste for disposal and the methods of handling and disposal of waste. The functional program shall outline the space requirements, including centralized waste collection and storage spaces. Size of spaces shall be determined based upon volume of projected waste and length of anticipated storage.

a. At docks or other waste removal areas, the functional program shall stipulate the location of compactors, balers, sharps, and recycling container staging. Red bag waste shall be staged in enclosed and secured areas. Biohazardous and environmentally hazardous materials, including mercury, nuclear reagent waste, and other regulated waste types, shall be segregated and secured.

b. If provided, regulated medical waste or infectious waste storage spaces shall have a floor drain, cleanable floor and wall surfaces, lighting, and exhaust ventilation, and should be safe from weather, animals and unauthorized entry. Refrigeration requirements for such storage facilities shall comply with state and/or local regulations.

7.33.C2 Waste treatment and disposal technologies

*a. On-site hospital incinerators shall comply with federal, state, and local regulatory and environmental requirements. The design and construction of incinerators and trash chutes shall comply with NFPA 82.

*b. Types of non-incineration waste treatment technology(ies) shall be determined by the facility in conjunction with environmental, economic , and regulatory considerations. The functional program shall describe waste treatment technology components.

(1) In determining the location for a non-incineration technology, safe transfer routes, distances from waste sources, temporary storage requirements, as well as space requirements for treatment equipment shall be considered. The location of the technology shall not cause traffic problems as waste is brought in and out. Odor, noise, and the visual impact of medical waste operations on patients, visitors, public access and security shall be considered.

(2) Space requirements for such technologies shall be determined by the equipment requirements, including associated area for opening waste entry doors, access to control panels, space for hydraulic lifts, conveyors, and operational clearances. Mobile or portable units, trailer-mounted units, underground installations, or all-weather enclosed shelters at an outdoor site may also be used, subject to local regulatory approvals.

(3) Exhaust vents, if any, from the treatment technology shall be located a minimum of 75 feet (22.86 meters) from inlets to HVAC systems. If the technology involves heat dissipation, sufficient cooling and ventilation shall be provided.

7~~.30.~~.33.C3. Nuclear waste disposal. See *Code of Federal Regulations*, title X, parts 20 and 35, concerning the handling and disposal of nuclear materials in health care facilities.

7.~~31~~ 34 Mechanical Standards

7.~~31.~~.34.A. General

***7.~~31.~~.34.A1.** The mechanical system should be designed for overall efficiency and appropriate life-cycle cost. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually. Recognized engineering procedures shall be followed for the most economical and effective results. A well-designed system can generally achieve energy efficiency at minimal additional cost and simultaneously provide improved patient comfort. Different geographic areas may have climatic and use conditions that favor one system over another in terms of overall cost and

efficiency. In no case shall patient care or safety be sacrificed for conservation.

~~Mechanical, electrical, and HVAC equipment may be located either internally, externally, or in separate buildings.~~

~~**7.31.A2.** Remodeling and work in existing facilities may present special problems. As practicality and funding permit, existing insulation, weather stripping, etc., should be brought up to standard for maximum economy and efficiency. Consideration shall be given to additional work that may be needed to achieve this.~~

7.~~31.~~.34.A~~3~~2. Facility design consideration shall include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.

7.~~31.~~.34.A~~4~~3. Insofar as practical, the facility ~~should~~ shall include provisions for recovery of waste cooling and heating energy (ventilation, exhaust, water and steam discharge, cooling towers, incinerators, etc.).

***7.~~31.~~.34.A~~5~~4.** Facility design consideration shall include recognized energy-saving mechanisms such as variable-air-volume (VAV) systems, load shedding, programmed controls for unoccupied periods (nights and weekends, etc.), and use of natural ventilation, site and climatic conditions permitting. ~~Systems with excessive installation and/or maintenance costs that negate long range energy savings should be avoided.~~

7.~~31.~~.34.A~~6~~5. Air-handling systems shall be designed with an economizer cycle where appropriate to use outside air. (Use of mechanically circulated outside air does not reduce need for filtration.)

It may be practical in many areas to reduce or shut down mechanical ventilation ~~during~~ under appropriate climatic and patient-care conditions and to use open windows for ventilation.

7.~~31.~~.34.A~~7~~6. Mechanical equipment, ductwork, and piping shall be mounted on vibration isolators as required to prevent unacceptable structure-borne vibration.

7.~~31.~~.34.A~~8~~7. Supply and return mains and risers for cooling, heating, and steam systems shall be equipped with valves to isolate the various sections of each system. Each piece of equipment shall have valves at the supply and return ends.

7.34.A8. Filter housing blank-off panels shall be permanently attached to the frame, constructed of rigid materials, and have sealing surfaces equal to or greater than the filter media installed in the filter frame.

7.34.A9. Upon completion of the equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions, parts lists, and complete procurement information, including equipment numbers and descriptions. Operating staff persons shall also be provided with instructions for properly operating systems and equipment. Required information shall include energy ratings as needed for future conservation calculations.

7.~~31.~~.34.B. Thermal and Acoustical Insulation

7.~~31.~~.34.B1. Insulation shall be provided within the building ~~shall be provided~~ to conserve energy, protect personnel, prevent vapor condensation, and reduce noise.

7.~~31.~~.34.B2. Insulation on cold surfaces shall include an exterior vapor barrier. (Material that will not absorb or transmit moisture will not require a separate vapor barrier.)

7.~~31.~~.34.B3. Insulation, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less as determined by an independent testing laboratory in accordance with NFPA 255.

7.~~31.~~.34.B4. If duct lining is used, it shall be coated and sealed, and shall meet ASTM C1071. These linings (including coatings, adhesives, and exterior surface insulation on pipes and ducts in spaces used as air supply plenums) shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as determined by an independent testing laboratory in accordance with NFPA 255. If existing lined ductwork is reworked in a renovation project, the liner seams and punctures shall be resealed.

7.~~31.~~.34.B5. Duct linings exposed to air movement shall not be used in ducts serving operating rooms, delivery rooms, LDR rooms, nurseries, protective environment rooms, and critical care units. This requirement shall not apply to mixing boxes and acoustical traps that have special coverings over such lining.

7.~~31.~~.34.B6. Existing accessible insulation within areas of facilities to be modernized shall be inspected, repaired, and/or replaced, as appropriate.

7.~~31.~~.34.B7. Duct lining shall not be installed within 15 feet (4.57 meters) downstream of humidifiers.

7.34.B8. All return ventilation shall be via ducted systems in patient care areas.

7.~~31.~~.34.C. Steam and Hot Water Systems

~~**7.31.C1.** Boilers shall have the capacity, based upon the net ratings published by the Hydronics Institute or another acceptable national standard, to supply the normal heating, hot water, and steam requirements of all systems and equipment. Their number and arrangement shall accommodate facility needs despite the breakdown or routine maintenance of any one boiler. The capacity of the remaining boiler(s) shall be sufficient to provide hot water service for clinical, dietary, and patient use; steam for sterilization and dietary purposes; and heating for operating, delivery, birthing, labor, recovery, intensive care, nursery, and general patient rooms.~~

7.34.C1. Boilers shall have the capacity, based upon the net ratings published by the Hydronics Institute or another acceptable national standard, to supply the normal heating, hot water, and steam requirements of all systems and equipment. Their number and arrangement shall accommodate facility needs despite the breakdown or routine maintenance of any one boiler. The capacity of the remaining boiler(s) shall be sufficient to provide hot water service for clinical, dietary, and patient use; steam for sterilization and dietary purposes; and heating for operating, delivery and birthing, labor, recovery, and intensive care. However, reserve capacity for facility space heating is not required in geographic areas where a design dry-bulb temperature of 25°F (-4°C) or more represents not less than 99 percent of the total hours in any one heating month as noted in ASHRAE's *Handbook of Fundamentals*, under the "Table for Climatic Conditions for the United States."

7.~~31.~~.34.C2. Boiler accessories, including feed pumps, heat-circulating pumps, condensate return pumps, fuel oil pumps, and waste heat boilers, shall be connected and installed to provide both normal and standby service.

***7.~~31.~~.34.D. ~~Air Conditioning,~~ Heating, ~~and~~ Ventilation, and Air Conditioning (HVAC) Systems**

***7.~~31.~~.34.D1.** All rooms and areas ~~in the facility~~ used for patient care shall have provisions for ventilation. The ventilation rates shown in Table 7.2 shall be used only as minimum standards; they do not preclude the use of higher, more appropriate rates. Alt~~T~~hough natural window ventilation for nonsensitive areas and patient rooms ~~may be employed~~is permitted, ~~weather permitting, availability of~~ mechanical ventilation ~~should~~ shall be considered for use in interior areas and during periods of temperature extremes. Fans serving exhaust systems shall be located at the discharge end and shall be readily serviceable. Air supply and exhaust in rooms for which no minimum total air change rate is noted may vary down to zero in response to room load. For rooms listed in Table 7.2, where VAV systems are used, minimum total air change shall be within limits noted. ~~Temperature control shall also comply with these standards.~~ Space temperature and relative humidity shall be as indicated in Table 7.2. To maintain asepsis control, airflow supply and exhaust ~~should~~ shall generally be controlled to ensure movement of air from "clean" to "less clean" areas, especially in critical areas. The ventilation systems shall be designed and balanced according to the requirements shown in Table 7.2 and in the applicable notes.

For renovation projects, prior to the start of construction and preferably during design, airflow and static pressure measurements shall be taken at the connection points of new ductwork to existing systems. This information shall be used by the designer to determine if existing systems have sufficient capacity for intended new purposes, and so any required modifications to the existing system can be included in the design documentation.

7.~~31.~~.34.D2. Exhaust systems may be combined to enhance the efficiency of recovery devices required for energy conservation. Local exhaust systems shall be used whenever possible in place of dilution ventilation to reduce exposure to hazardous gases, vapors, fumes, or mists. Airborne infection isolation rooms shall not be served by exhaust systems incorporating a heat wheel.

Exhaust outlets from areas that may be contaminated shall be above roof level and arranged to minimize recirculation of exhaust air into the building. The requirement for a 25-foot (7.62-meter) separation also pertains to the distance between the intake and the exhaust and/or gas vent off of packaged rooftop units.

***7.~~31.~~.34.D3.** Fresh air intakes shall be located at least 25 feet (7.62 meters) from exhaust outlets of ventilating systems, combustion equipment stacks, medical-surgical vacuum systems, plumbing vents, or areas that may collect vehicular exhaust or other noxious fumes. (Prevailing winds and/or proximity to other structures may require greater clearances.) Plumbing and vacuum vents that terminate at a level above the top of the air intake may be located as close as 10 feet (3.05 meters). The bottom of outdoor air intakes serving central systems shall be as high as practical, but at least 6 feet (1.83 meters) above ground level, or, if installed above the roof, 3 feet (0.91 meter) above roof level. ~~Exhaust outlets from areas that may be contaminated shall be above roof level and arranged to minimize recirculation of exhaust air into the building. The requirement for a 25-foot (7.62-meter) separation also pertains to the distance between the intake and the exhaust and/or gas vent off of packaged rooftop units.~~

***7.~~31.~~.34.D4.** In new construction and major renovation work, air supply for operating and delivery rooms shall be from non-aspirating diffusers with a face velocity in the range of 25 to 35 fpm (0.13 to 0.18 m/s), located ~~ceiling outlets~~ near the center of the work area. Return air shall be near the floor level, at a minimum. Return air shall be permitted high on the walls, in addition to the low returns. Each operating and delivery room shall have at least two return-air inlets located as ~~remotely~~ far from each other as practical. ~~(Design should consider t~~Turbulence and other factors of air movement shall be considered to minimize the fall of particulates onto sterile surfaces.~~)~~ Temperature shall be individually

controlled for each operating and delivery room. During unoccupied hours, operating room air change rates may be reduced, provided that the positive room pressure is maintained as required in Table 7.2. Operating room ventilation systems shall operate at all times, except during maintenance and conditions requiring shutdown by the building's fire alarm system. Where extraordinary procedures, such as organ transplants, justify special designs, installation shall properly meet performance needs as determined by applicable standards. These special designs should be reviewed on a case-by-case basis. ~~Temperature shall be individually controlled for each operating and delivery room.~~

7.~~31.~~.34.D5. ~~Air supply for rooms used for invasive procedures shall be at or near the ceiling. Return or exhaust air inlets shall be near the floor level. Exhaust grills for anesthesia evacuation and other special applications shall be permitted to be installed in the ceiling.~~ When anesthesia scavenging systems are required by Section 7.34.D6, air supply shall be at or near the ceiling. Return or exhaust air inlets shall be near the floor level.

***7.~~31.~~.34.D6.** Each space routinely used for administering inhalation anesthesia and inhalation analgesia shall be served by a scavenging system to vent waste gases. If a vacuum system is used, the gas-collecting system shall be arranged so that it does not disturb patients' respiratory systems. Gases from the scavenging system shall be exhausted directly to the outside. The anesthesia evacuation system may be combined with the room exhaust system, provided that the part used for anesthesia gas scavenging exhausts directly to the outside and is not part of the recirculation system. Scavenging systems are not required for areas where gases are used only occasionally, such as the emergency department, offices for routine dental work, etc. Acceptable concentrations of anesthetizing agents are unknown at this time. The absence of specific data makes it difficult to set specific standards. However, any scavenging system should be designed to remove as much of the gas as possible from the room environment. It is assumed that anesthetizing equipment will be selected and maintained to minimize leakage and contamination of room air.

7.~~31.~~.34.D7. The bottoms of ventilation (supply/return) openings shall be at least 3 inches (76.2 millimeters) above the floor.

7.~~31.~~.34.D8. All central ventilation or air conditioning systems shall be equipped with filters with efficiencies equal to, or greater than, those specified in Table 7.3. Where two filter beds are required, filter bed no. 1 shall be located upstream of the air conditioning equipment and filter bed no. 2 shall be downstream of any fan or blowers. Filter efficiencies, tested in accordance with ASHRAE 52.1-1992, shall be average. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing duct work. All joints between filter segments and enclosing duct-work shall have gaskets or seals to provide a positive seal against air leakage. A manometer shall be installed across each filter bed having a required efficiency of 75 percent or more, including hoods requiring HEPA filters. Provisions shall be made to allow access for field testing.

***7.~~31.~~.34.D9.** If duct humidifiers are located upstream of the final filters, they shall be at least 15 feet (4.57 meters) upstream of the final filters. Ductwork with duct-mounted humidifiers shall have a means of water removal. An adjustable high-limit humidistat shall be located downstream of the humidifier to reduce the potential for condensation inside the duct. Humidifiers shall be connected to airflow proving switches that prevent humidification unless the required volume of airflow is present or high-limit humidistats are provided. All duct takeoffs ~~should~~shall be sufficiently downstream of the humidifier to ensure complete moisture absorption. Steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.
~~If duct humidifiers are located upstream of the final filters, they shall be located at least 15 feet (4.57~~

~~meters) upstream of the final filters. Ductwork with duct mounted humidifiers shall have a means of water removal. An adjustable high limit humidistat shall be located downstream of the humidifier to reduce the potential of condensation inside the duct. All duct takeoffs should be sufficiently downstream of the humidifier to ensure complete moisture absorption. Steam humidifiers shall be used. Reservoir type water spray or evaporative pan humidifiers shall not be used.~~

7~~.31.~~.34.D10. Air-handling duct systems shall be designed with accessibility for duct cleaning, and shall meet the requirements of NFPA 90A.

7~~.31.~~.34.D11. Ducts that penetrate construction intended to protect against x-ray, magnetic, RFI, or other radiation shall not impair the effectiveness of the protection.

7~~.31.~~.34.D12. Fire and smoke dampers shall be constructed, located, and installed in accordance with the requirements of NFPA 101, 90A, and the specific damper's listing requirements. Fans, dampers, and detectors shall be interconnected so that damper activation will not damage ducts. Maintenance access shall be provided at all dampers. All damper locations ~~should~~ shall be shown on design drawings. Dampers ~~should~~ shall be activated in accordance with NFPA 90A ~~by fire or smoke sensors, not by fan cutoff alone~~. Switching systems for restarting fans may be installed for fire department use in venting smoke after a fire has been controlled. However, provisions should be made to avoid possible damage to the system due to closed dampers. When smoke partitions are required, heating, ventilation, and air conditioning zones shall be coordinated with compartmentation insofar as practical to minimize need to penetrate fire and smoke partitions.

7~~.31.~~.34.D13. Hoods and safety cabinets may be used for normal exhaust of a space providing minimum air change rates are maintained. If air change standards in Table 7.2 do not provide sufficient air for proper operation of exhaust hoods and safety cabinets (when in use), supplementary makeup air (filtered and preheated) shall be provided around these units to maintain the required airflow direction and exhaust velocity. Use of makeup air will avoid dependence upon infiltration from outdoor and/or from contaminated areas. Makeup systems for hoods shall be arranged to minimize "short circuiting" of air and to avoid reduction in air velocity at the point of contaminant capture.

7~~.31.~~.34.D14. Laboratory fume hoods shall meet the following general standards:

a. Have an average face velocity of at least 75 feet per minute (0.38 meters per second).

b. Be connected to an exhaust system to the outside that is separate from the building exhaust system.

c. Have an exhaust fan located at the discharge end of the system.

d. Have an exhaust duct system of noncombustible corrosion-resistant material as needed to meet the planned usage of the hood.

7~~.31.~~.34.D15. Laboratory hoods shall meet the following special standards:

a. Fume hoods, and their associated equipment in the air stream, intended for use with perchloric acid and other strong oxidants, shall be constructed of stainless steel or other material consistent with special exposures, and be provided with a water wash and drain system to permit periodic flushing of duct and hood. Electrical equipment intended for installation within such ducts shall be designed and constructed to resist penetration by water. Lubricants and seals shall not contain organic materials. When perchloric

acid or other strong oxidants are only transferred from one container to another, standard laboratory fume hoods and the associated equipment may be used in lieu of stainless steel construction.

b. In new construction and major renovation work, each hood used to process infectious or radioactive materials shall have a minimum face velocity of 90 to 110 feet per minute (0.45 to 0.56 meters per second) with suitable pressure-independent air--modulating devices and alarms to alert staff of fan shutdown or loss of airflow. Each shall also have filters with a 99.97 percent efficiency ~~[~~(based on the ~~dioctyl phthalate (~~DOP~~)~~ test method~~]~~) in the exhaust stream, and be designed and equipped to permit the safe removal, disposal, and replacement of contaminated filters. Filters shall be as close to the hood as practical to minimize duct contamination. Fume hoods intended for use with radioactive isotopes shall be constructed of stainless steel or other material suitable for the particular exposure and shall comply with NFPA 801, *Facilities for Handling Radioactive Materials*. **Note**: Radioactive isotopes used for injections, etc., without probability of airborne particulates or gases may be processed in a clean-workbench-type hood where acceptable to the Nuclear Regulatory Commission.

7~~.31..~~34.D16. Exhaust hoods handling grease-laden vapors in food preparation centers shall comply with NFPA 96. All hoods over cooking ranges shall be equipped with grease filters, fire--extinguishing systems, and heat-actuated fan controls. Cleanout openings shall be provided every 20 feet (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. ~~(~~Horizontal runs of ducts serving range hoods ~~should~~ shall be kept to a minimum.~~)~~ Food preparation centers shall have ventilation systems whose air supply mechanisms are interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit corridors does not compromise the exit corridor restrictions of NFPA 90A, the pressure requirements of NFPA 96, or the maximum defined in the table. The number of air changes may be reduced or varied to any extent required for odor control when the space is not in use.

7~~.31..~~34.D17. The ventilation system for anesthesia storage rooms shall conform to the requirements of NFPA 99, including the gravity option. Mechanically operated air systems are optional in ~~this~~ these rooms.

7~~.31..~~34.D18. The ventilation system for the space that houses ethylene oxide (ETO) sterilizers ~~should~~ shall be designed to:

a. ~~Provide a~~A dedicated (not connected to a return air or other exhaust system) exhaust system shall be provided. Refer to 29 CFR Part 1910.1047.

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

c. ~~Ensure that g~~General airflow ~~is~~shall be away from sterilizer operator(s).

d. Provide a dedicated exhaust duct system for ETO. The exhaust outlet to the atmosphere ~~should~~ shall be at least 25 feet (7.62 meters) away from any air intake.

e. An audible and visual alarm shall activate in the sterilizer work area, and in a 24-hour staffed location,

upon loss of airflow in the exhaust system.

7.~~31.~~.34.D19. Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit workstation temperatures.

7.~~31.~~.34.D20. Where conditions permit, ~~G~~gravity exhaust may be used~~, where conditions permit,~~ for nonpatient areas such as boiler rooms, central storage, etc.

7.~~31.~~.34.D21. The energy-saving potential of variable-air-volume systems is recognized, and the~~se~~ standards herein are intended to maximize appropriate use of ~~that~~ those systems. Any system ~~utilized~~ used for occupied areas shall include provisions to avoid air stagnation in interior spaces where thermostat demands are met by temperatures of surrounding areas.

7.~~31.~~.34.D22. Special consideration shall be given to the type of heating and cooling units, ventilation outlets, and appurtenances installed in patient-occupied areas of psychiatric units. The following shall apply:

a. All air grilles and diffusers shall be of a type that prohibits the insertion of foreign objects. All exposed fasteners shall be tamper-resistant.

b. All convector or HVAC enclosures exposed in the room shall be constructed with rounded corners and shall have enclosures fastened with tamper-resistant screws.

c. HVAC equipment shall be of a type that minimizes the need for maintenance within the room.

7.~~31.~~.34.D23. Rooms used for sputum induction, aerosolized pentamadine treatments, or other cough-inducing procedures shall meet the requirements of Table 7.2 for airborne infection isolation rooms. If booths are used, refer to section 7.~~15~~18.D.~~E.~~

7.~~31.~~.34.D24. Non-central air-handling systems~~,~~ (i.e., individual room units that are used for heating and cooling purposes) (fan-coil units, heat pump units, etc.) shall be equipped with permanent (cleanable) or replaceable filters. The filters shall have a minimum efficiency of 68 percent weight arrestance (MERV 3). These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air-handling system with the proper filtration, as noted in Table 7.3.

***7.~~31.~~.34.D25.** Rooms where gluteraldehyde is used shall be maintained at a negative pressure with respect to surrounding areas, unless dictated otherwise for specific rooms in Table 7.2. In lieu of special ventilation, a certified, filtered recirculating hood designed for gluteraldehyde ~~can~~ may be substituted.

7.34.D26. The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., *Aspergillus* spores). These special ventilation areas shall be designed to provide directed airflow from the cleanest patient care area to less clean areas. These rooms shall be protected with HEPA filters at 99.97 percent efficiency for a 0.3 µm sized particle in the supply airstream. These interrupting filters protect patient rooms from maintenance-derived release of environmental microbes from the ventilation system components. Recirculation HEPA filters can be used to increase the equivalent room air exchanges. Constant volume airflow is required for consistent ventilation for the protected environment. If the facility determines that airborne infection isolation is necessary for protective environment patients, an anteroom should be provided. Rooms with reversible airflow provisions for the purpose of switching between protective environment and airborne infection

isolation functions are not acceptable.

7.34.D27. The infectious disease isolation room described in these guidelines is to be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. The design of airborne infection isolation (AII) rooms should include the provision for normal patient care during periods not requiring isolation precautions. Supplemental recirculating devices may be used in the patient room, to increase the equivalent room air exchanges; however, such recirculating 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.

7.34.D28. In new construction, horizontal offsets of duct system risers penetrating more than one floor shall not be permitted.

7.~~31.~~.34.E. Plumbing and Other Piping Systems

Unless otherwise specified herein, all plumbing systems shall be designed and installed in accordance with *National Standard Plumbing Code.*

7.~~31.~~.34.E1. The following standards shall apply to plumbing fixtures:

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

b. Water spouts used in lavatories and sinks shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc.

c. General handwashing stations used by medical and nursing staff, ~~and all lavatories used by~~ patients, and food handlers shall be trimmed with valves that can be operated without hands. ~~(~~Single ~~-~~lever or wrist blade devices ~~may~~ shall be ~~used~~permitted.~~)~~ Blade handles used for this purpose shall not exceed 4-1/2 inches (114.3 millimeters) in length. Handles on clinical sinks shall be at least 6 inches (152.4 millimeters) long. Freestanding scrub sinks and lavatories used for scrubbing in procedure rooms shall be trimmed with foot, knee, or ultrasonic controls; ~~(no~~ single ~~-~~lever wrist blades~~)~~ are not permitted.

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

e. Showers and tubs shall have nonslip walking surfaces.

7.~~31.~~.34.E2. The following standards shall apply to potable water supply systems:

a. Systems shall be designed to supply water at sufficient pressure to operate all fixtures and equipment during maximum demand. Supply capacity for hot- and cold-water piping shall be determined on the basis of fixture units, using recognized engineering standards. When the ratio of plumbing fixtures to occupants is proportionally more than required by the building occupancy and is in excess of 1,000 plumbing fixture units, a diversity factor is permitted.

b. Each water service main, branch main, riser, and branch to a group of fixtures shall have valves. Stop valves shall be provided for each fixture. Appropriate panels for access shall be provided at all valves

where required.

c. Vacuum breakers or backflow prevention devices shall be installed on hose bibbs and supply nozzles used for connection of hoses or tubing in laboratories, housekeeping sinks, bedpan-flushing attachments, and autopsy tables, etc.

d. Bedpan-flushing devices (may be cold water) shall be provided in each inpatient toilet room; however, installation is optional in psychiatric and alcohol-abuse units where patients are ambulatory.

e. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.

f. Systems shall be protected against cross-connection in accordance with American Water Works Association (AWWA) Recommended Practice for Backflow Prevention and Cross-connection Control.

g. Emergency eyewash and showers shall comply with ANSI Z358.1.

7.31..34.E3. The following standards shall apply to hot water systems:

a. The water-heating system shall have sufficient supply capacity at the temperatures and amounts indicated in Table 7.4. Water temperature is measured at the point of use or inlet to the equipment. Water shall be permitted to be stored at higher temperatures.

b. Hot-water distribution systems serving patient care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet. Non-recirculated fixture branch piping shall not exceed 25 feet (7.62 meters) in length.

*c. Provisions shall be included in the domestic hot water system to limit the amount of *Legionella* bacteria and opportunistic waterborne pathogens.

d. Dead-end piping (risers with no flow, branches with no fixture) shall not be installed. In renovation projects, dead-end piping shall be removed. Empty risers, mains, and branches installed for future use shall be permitted.

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

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

b. Drain lines serving some types of automatic blood-cell counters must shall be of carefully selected material that will eliminate potential for undesirable chemical reactions (and/or explosions) between sodium azide wastes and copper, lead, brass, and solder, etc.

c. Insofar as possible, drainage piping shall not be installed within the ceiling or exposed in operating and delivery rooms, nurseries, food preparation centers, food--serving facilities, food storage areas, central services, electronic data processing areas, electric closets, and other sensitive areas. Where exposed, overhead drain piping in these areas is unavoidable, special provisions shall be made to protect the space below from leakage, condensation, or dust particles.

d. Floor drains shall not be installed in operating and delivery rooms.

*e. If a floor drain is installed in cystoscopy, it shall contain a nonsplash, horizontal-flow flushing bowl beneath the drain plate.

f. Drain systems for autopsy tables shall be designed to positively avoid splatter or overflow onto floors or back siphonage and for easy cleaning and trap flushing.

g. Building sewers shall discharge into community sewerage. Where such a system is not available, the facility shall treat its sewage in accordance with local and state regulations.

h. Kitchen grease traps shall be located and arranged to permit easy access without the need to enter food preparation or storage areas. Grease traps shall be of capacity required and shall be accessible from outside of the building without need to interrupt any services.

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

j. In dietary areas, floor drains and/or floor sinks shall be of type that can be easily cleaned by removal ~~al~~ing ~~of~~the cover. ~~Provide f~~Floor drains or floor sinks shall be provided at all "wet" equipment (as ice machines) and as required for wet cleaning of floors. Copper tubing shall be provided for supply connections to ice machines. ~~Provide r~~Removable stainless steel mesh shall be provided in addition to grilled drain covers to prevent entry of large particles of waste ~~which~~ that might cause stoppages. Location of floor drains and floor sinks shall be coordinated to avoid conditions where locations of equipment make removal of covers for cleaning difficult.

7~~.31.~~.34.E5. The installation, testing, and certification of nonflammable medical gas and air systems shall comply with the requirements of NFPA 99. (See Table 7.5 for rooms requiring station outlets.)

7.34.E6. The vacuum discharge shall be located at least 25 feet from all domestic air intakes, doors, and operable windows.

7~~.31.~~.34.E~~6~~7. Clinical vacuum system installations shall be in accordance with NFPA 99. (See Table 7.5 for rooms that require station outlets.)

7~~.31.~~.34.E~~7~~8. All piping, except control-line tubing, shall be identified. All valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.

7~~.31.~~.34.E~~8~~9. ~~Hemodialysis~~
In new construction and renovation, in any hospital ~~location~~ where hemodialysis or hemoperfusion is routinely performed, ~~there shall be~~ a separate water supply and a drainage facility that does not interfere with handwashing shall be provided.

7~~.31.~~.34.E~~9~~10. When the functional program includes hemodialysis, continuously circulated filtered cold water shall be provided. Piping shall be in accordance with AAMI RD6.2.

7~~.31.~~.34.E1~~0~~1. ~~Provide c~~Condensate drains for cooling coils shall be ~~of~~a type that may be cleaned as needed without disassembly. (Unless specifically required by local authorities, traps are not required for condensate drains.) ~~Provide~~ An air gap shall be provided where condensate drains empty into floor drains. ~~Provide h~~Heater elements shall be provided for condensate lines in freezer or other areas where freezing may be a problem.

7.~~31.~~.34.E1~~1~~2. No plumbing lines ~~may~~ shall be exposed overhead or on walls where possible accumulation of dust or soil may create a cleaning problem or where leaks would create a potential for food contamination.

***7.34.E13.** Where provided, interior open water features shall be equipped to safely treat water and protect occupants from infectious or irritating aerosols. The design shall limit human contact with the water. This requirement does not pertain to aquariums.

7.~~32~~ 35 Electrical Standards

7.~~32.~~.35.A. General

7.~~32.~~.35.A1. All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99 and shall be listed as complying with available standards of listing agencies, or other similar established standards where such standards are required. Field labeling of equipment and materials will be permitted only when provided by a nationally recognized testing laboratory that has been certified by the Occupational Safety and Health Administration (OSHA) for that referenced standard.

7.~~32.~~.35.A2. The electrical installations, including alarm, nurses call, and communication systems, shall be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment shall show compliance with applicable codes and standards.

~~**7.32.A3.** Shielded isolation transformers, voltage regulators, filters, surge suppressors, and other safeguards shall be provided as required where power line disturbances are likely to affect data processing and/or automated laboratory or diagnostic equipment.~~

7.~~32.~~.35.B. Services and Switchboards
Main switchboards shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only. Switchboards shall be convenient for use, readily accessible for maintenance, away from traffic lanes, and located in a dry, ventilated space free of corrosive or explosive fumes, gases, or any flammable material. Overload protective devices shall operate properly in ambient room temperatures.

7.~~32.~~.35.C. Panelboards
~~Panelboards serving normal lighting and appliance circuits shall be located on the same floor as the circuits they serve. Panelboards serving critical branch emergency circuits shall be located on each floor that has major users (operating rooms, delivery suites, intensive care, etc.). Panelboards serving Life Safety emergency circuits may also serve floors above and/or below.~~ Panelboards serving critical branch, equipment system, or normal system loads shall be located on the same floor as the loads to be served. Panelboards serving life safety branch loads may be located on the floor above or the floor below the loads to be served. New panelboards shall not be located in public access corridors.

7.~~32.~~.35.D. Lighting

***7.~~32.~~.35.D1.** The Illuminating Engineering Society of North America (IES) has developed recommended lighting levels for health care facilities. Refer to the IES publication RP-29, *Lighting for Hospitals and*

Health Care Facilities.
~~The reader should refer to the *IES Handbook.*~~

7.32.35.D2. Approaches to buildings and parking lots, and all occupied spaces within buildings, shall have fixtures that can be illuminated as necessary.

7.32.35.D3. Patient rooms shall have general lighting and night lighting. A reading light shall be provided for each patient. Reading light controls shall be accessible to the patient(s) without the patient having to get out of bed. Incandescent and halogen light sources that produce heat shall be avoided to prevent burns to the patient and/or bed linen. Unless specifically designed to protect the space below, ~~T~~the light source ~~should~~ shall be covered by a diffuser or lens. Flexible light arms, if used, shall be mechanically controlled to prevent the lamp from contacting the bed linen. At least one night light fixture in each patient room shall be controlled at the room entrance. Lighting for coronary and intensive care bed areas shall permit staff observation of the patient while minimizing glare.

7.32.35.D4. Operating and delivery rooms shall have general lighting in addition to special lighting units provided at surgical and obstetrical tables. General lighting and special lighting shall be on separate circuits.

7.32.35.D5. Nursing unit corridors shall have general illumination with provisions for reducing light levels at night.

~~**7.325.D6.** Light intensity for staff and patient needs should generally comply with health care guidelines set forth in the IES publication. Consideration should be given to controlling intensity and/or wavelength to prevent harm to the patient's eyes (i.e., retina damage to premature infants and cataracts due to ultraviolet light).~~

~~Many procedures are available to satisfy lighting requirements, but the design should consider light quality as well as quantity for effectiveness and efficiency. While light levels in the IES publication are referenced herein, those publications include other useful guidance and recommendations which the designer is encouraged to follow.~~

7.32.35.D7. ~~Consideration should be given to the~~ As required by the functional program, special needs of the elderly shall be incorporated into the lighting design. Excessive contrast in lighting levels that makes effective sight adaptation difficult ~~should~~ shall be minimized. Refer to IES publication, RP-28, *Lighting and the Visual Environment for Senior Living*.

7.32.35.D8. A portable or fixed examination light shall be provided for examination, treatment, and trauma rooms.

7.32.35.D9. Light intensity of required emergency lighting shall generally comply with the IES recommendations. Egress and exit lighting shall comply with NFPA 101.

7.32.35.E. Receptacles

7.32.35.E1. Each operating and delivery room shall have at least six receptacles convenient to the head of the procedure table.

Each operating room shall have at least 16 simplex or eight duplex receptacles. Where mobile x-ray,

laser, or other equipment requiring special electrical configurations is used, additional receptacles distinctively marked for x-ray or laser use shall be provided.

7.~~32.~~35.E2. Each patient room shall have duplex-grounded receptacles. There shall be one at each side of the head of each bed; one for television, if used; one on every other wall; and one for each motorized bed. Receptacles may be omitted from exterior walls where construction or room configuration makes installation impractical. Nurseries shall have at least two duplex-grounded receptacles for each bassinet. Intermediate care rooms shall have at least four duplex outlets per bed. The outlets shall be arranged to provide two duplex outlets on each side of the head of the bed. Critical care areas as defined by NFPA 99 and NFPA 70, including pediatric and newborn intensive care units, shall have at least seven duplex outlets at the head of each bed, crib, or bassinet. Trauma and resuscitation rooms shall have eight duplex outlets located convenient to the head of each bed. Emergency department examination and treatment rooms shall have a minimum of six duplex outlets located convenient to the head of each bed. Approximately 50 percent of critical and emergency care outlets shall be connected to emergency system power and be so labeled. Each general care examination and treatment table and each work table shall have access to two duplex receptacles.

7.~~32.~~35.E3. Duplex-grounded receptacles for general use shall be installed approximately 50 feet (15.24 meters) apart in all corridors and within 25 feet (7.62 meters) of corridor ends. Receptacles in pediatric and psychiatric unit corridors shall be of the tamper-resistant type. Special receptacles marked for x-ray use shall be installed in corridors of patient areas so that mobile equipment may be used anywhere within a patient room using a cord length of 50 feet (15.24 meters) or less. If the same mobile x-ray unit is used in operating rooms and in nursing areas, receptacles for x-ray use shall permit the use of one plug in all locations. Where capacitive discharge or battery-powered x-ray units are used, special x-ray receptacles are not required.

7.~~32.~~35.E4. Electrical receptacle cover plates or electrical receptacles supplied from the emergency systems shall be distinctively colored or marked for identification. If color is used for identification purposes, the same color shall be used throughout the facility.

7.~~32.~~35.E5. For renal dialysis units, two duplex receptacles shall be on each side of a patient bed or lounge chair. One duplex receptacle on each side of the bed shall be connected to emergency power.

7.35.E6. LDRP rooms shall have receptacles as required for patient rooms (Section 7.35.E2); in addition, the bassinet shall have receptacles as required for nursery bassinets (Section 7.35.E2).

7.~~32.~~35.F. Equipment

7.~~32.~~35.F1. At inhalation anesthetizing locations, all electrical equipment and devices, receptacles, and wiring shall comply with applicable sections of NFPA 99 and NFPA 70.

7.~~32.~~35.F2. Fixed and mobile x-ray equipment installations shall conform to articles 517 and 660 of NFPA 70.

7.~~32.~~35.F3. The x-ray film illuminator unit or units for displaying at least two films simultaneously shall be installed in each operating room, specified emergency treatment rooms, and x-ray viewing room of the radiology department. All illuminator units within one space or room shall have lighting of uniform intensity and color value.

7.32..35.F4. Ground-fault circuit interrupters shall comply with NFPA 70. When ground-fault circuit interrupters (GFCI) are used in critical areas, provisions shall be made to ie nsure that other essential equipment is not affected by activation of one interrupter.

~~**7.32.F5.** In areas such as critical care units and special nurseries where a patient may be treated with an internal probe or catheter connected to the heart, the ground system shall comply with applicable sections of NFPA 99 and NFPA 70.~~

***7.32..35.F65.** Special equipment is identified in the following sections: Critical Care Units, Newborn Nurseries, Pediatric and Adolescent Unit, Psychiatric Nursing Unit, Surgical Suites, Obstetrical Suite, Emergency Service, Imaging Suite, Nuclear Medicine, Laboratory Suite, Rehabilitation Therapy Department, Renal Dialysis Unit, Respiratory Therapy Service, Morgue, Pharmacy, Dietary Facilities, Administration and Public Areas, Medical Records, Central Services, General Stores, Linen Services.

These sections shall be consulted to ensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

~~[make this appendix to 7.33.F6] **7.32.F7.** There should be special attention paid to safety hazards associated with equipment cabling. Every attempt should be made to minimize these hazards, where practical.~~

***7.32..35.F86.** If operation of a scrub sink or a handwashing station in critical care areas, emergency departments, labor and delivery, and surgical suites is dependent on the building electrical service, it shall be connected to the essential electrical system.

7.32..35.G. Nurses Calling System

7.32..35.G1. In patient areas, each patient room shall be served by at least one calling station for two-way voice communication. Each bed shall be provided with a call device. Two call devices serving adjacent beds may be served by one calling station. Calls shall activate a visible signal in the corridor at the patient's door, in the clean work-room, in the soiled work-room, in Mmedication, charting, clean linen storage, nourishment, equipment storage, and examination/treatment room(s), and at the nursing station of the nursing unit. In multi-corridor nursing units, additional visible signals shall be installed at corridor intersections. In rooms containing two or more calling stations, indicating lights shall be provided at each station. Nurses calling systems at each calling station shall be equipped with an indicating light that remains lighted as long as the voice circuit is operating.

7.32..35.G2. A nurses emergency call system shall be provided at each inpatient toilet, bath, sitz bath, and shower room. A nurses emergency call shall be accessible to a collapsed patient lying on the floor. Inclusion of a pull cord will satisfy this standard.

The emergency call shall be designed so that a signal activated at a patient's calling station will initiate a visible and audible signal distinct from the regular nurse calling system that can be turned off only at the patient calling station. The signal shall activate an annunciator panel at the nurse station, a visible signal in the corridor at the patient's door, and at other areas defined by the functional program. Provisions for emergency calls ~~will~~ shall also be ~~needed~~ provided in outpatient and treatment areas where patients may be subject to incapacitation.

7.32..35.G3. In areas such as critical care, recovery, ~~and~~ pre-op, and emergency, where patients are under

constant visual surveillance, the nurses call may be limited to the following:

a. ~~a~~A bedside button or station that activates a signal readily seen at the control station to summon additional assistance (see Section 7.35.G4)~~.~~

b. An emergency code resuscitation alarm to summon medical assistance from the code team.

7~~.32.~~.35.G4. A staff emergency assistance system for staff to summon additional assistance shall be provided in each operating, delivery, recovery, emergency examination, ~~and/or~~ treatment, and intermediate care area, and in critical care units, nurseries, special procedure rooms, cardiac catheterization rooms, stress-test areas, triage, outpatient surgery, admission and discharge areas, and areas for psychiatric patients, including seclusion and security rooms, anterooms and toilet rooms serving them, communal toilet and bathing facility rooms, and dining, activity, therapy, exam, and treatment rooms. This system shall annunciate ~~visually~~ visibly and audibly in the clean work~~-~~room, in the soiled work~~-~~room, in medication, charting, clean linen storage, nourishment, equipment storage, and examination/treatment room(s) if provided, and at the nursing station of the nursing unit, with backup to another staffed area from which assistance can be summoned.

7~~.32.~~.35.G5. In critical care units, recovery, and pre-op, the call system shall include provisions for an emergency code resuscitation alarm to summon assistance from outside the unit.

7~~.32.~~.35.G6. A nurse call is not required in psychiatric nursing units, but if it is included, provisions shall be made for easy removal, or for covering call button outlets. In psychiatric nursing units, all hardware shall have tamper-resistant fasteners.

7~~.32.~~.35.G7. Patient toilet rooms within the ~~I~~imaging ~~S~~suite shall be equipped with a nurses emergency call.

7~~.32.~~.35.G8. Toilet rooms in renal dialysis units shall be served by an emergency call. The ~~C~~call shall activate a signal at the nurses' station.

7~~.32.~~.35.G9. Alternate technologies ~~can may~~shall be ~~considered~~ permitted for emergency or nurse call systems. If radio frequency systems are utilized, consideration ~~should~~ shall be given to electromagnetic compatibility between internal and external sources.

7~~.32.~~.35.H. Emergency Electric Service
Emergency power shall be provided for in accordance with NFPA 99, NFPA 101, and NFPA 110. Where stored fuel is required, storage capacity shall permit continuous operation for at least 24 hours.

7~~.32.~~.35.I. Fire Alarm
All health care ~~occupancies~~ facilities shall be provided with a fire alarm system in accordance with NFPA 101 and NFPA 72.

7~~.32.~~.35.J. Telecommunications and Information Systems

7~~.32.~~.35.J1. Locations for terminating telecommunications and information system devices shall be provided.

7~~.32.~~.35.J2. A room shall be provided for central equipment locations. Special air conditioning and

voltage regulation shall be provided when recommended by the manufacturer.

7.~~32.~~ 35. J3. All patient care-related telecommunications and information systems shall be powered from the essential electrical system.

7.35.K. Electronic Surveillance Systems

7.35.K1. Electronic surveillance systems include but are not limited to patient elopement systems, door access/control systems, video/audio monitoring systems, patient location systems, and infant abduction prevention systems.

7.35.K2. Electronic surveillance systems are not required, but if provided for the safety of the patients, any devices in patient areas need to be mounted such that they are unobtrusive and in a tamper-resistant enclosure.

7.35.K3. Electronic surveillance system monitoring devices need to be located in a location such that they are not readily observable by the general public or patients.

7.35.K4. Electronic surveillance systems, if installed, shall be supplied power from the emergency electrical system in the event of a disruption of normal electrical power.

***7.~~3~~336 Hyperbaric Suite**