HCAi
Department of Health Care Access and Information

HBSB Codes and Processes Committee

California Mechanical Code, Part 4
Initial Express Terms (IET) Presentation
2024 Triennial Code Cycle
1/10/2024

Font Legend

- Model Code is upright black FONT
- *Existing State amendments are italicized in black font*
- *New State amendments are underlined and italicized in blue font*
- ~~*Deletions of State amendments are stricken out in gray font*~~

Chapter 2 - Definitions

210.0 – H –

Health Facilities. [OSHPD 1, 1R, 2, 3, 4 & 5] *Buildings specified within the statutory authority of the Office of Statewide ~~Health~~ Hospital Planning and Development.*

Section 318 - Scope

318.1 Applicability. *This part is applicable to health facilities regulated by OSHPD (~~See Adoption Tables for application for specific sections~~).*

Note: *This section has no corresponding provisions in the UMC. For the scope and authority of each state agency, refer to Chapter 1.*

318.2 Services/Systems and Utilities. *Refer to Section 1224.4.1, 1225.2.1 and 1228.4.1.1 of the California Building Code.*

Section 321.0 – Essential Power

SECTION 321.0 Essential Mechanical Provisions. [OSHPD 1, ~~1R~~, 2, 3 (Surgical Clinics only) 4 & 5] *During periods of power outages essential electrical power shall be provided for the following equipment:*

. . .

321.3 *Cooling equipment necessary to maintain temperature and humidity listed in Table 4A for a minimum of one operating room and other category 1 spaces as identified in the facility's safety risk assessment.*

. . .

321.~~5~~6 *All control components, ~~and~~ control systems and fire and smoke dampers necessary for the normal operation of equipment required to have essential electrical power.*

Section 322 – Sensitive Areas

SECTION 322.0 Sensitive Areas or Rooms. [OSHPD 1, ~~1R~~, 2, 3 (Surgical Clinics) 4 & 5] *The following are sensitive areas or rooms:*
(1) Operating room~~;~~
(2) Hybrid operating room
(3) Cesarean operating room
(4) Delivery room~~;~~
(5) Surgical Cystoscopy
(6) Class 3 imaging
(7) Cardiac catheterization lab
(8) Trauma/cardiac room
(10) Post-anesthesia care unit
(11) Intensive care
(12) Newborn intensive-care nursery unit
(13) Newborn nursery
(14) Burn unit
(15) Protective Environment Room
(16) Procedure room
(17) Class 2 imaging
(18) Gastrointestinal endoscopy procedure room

Section 401.0 General

401.1 Applicability. This chapter contains requirements for ventilation air supply, exhaust, and makeup air requirements for occupiable spaces within a building. ***[OSHPD 1, 1R, 2, 3, 4 & 5]*** *See Sections ~~404.0~~406.0 through ~~418.0~~419.0.* ***[SFM]*** *Air filters shall comply with all requirements of Part 12, Title 24, Chapter 12-71, SFM Standard 12-71-1.* Spaces within buildings, except those within a dwelling unit in residential occupancies where occupants are nontransient, shall comply with Section 402.0 through Section 404.0. Requirements for ventilation air rate for dwelling units in residential occupancies, where the occupants are nontransient, shall be in accordance with Section 405.0.

Section 402.0 – Ventilation Air

402.0 Ventilation Air.
402.1 Occupiable Spaces. Occupiable spaces listed in Table 402.1 ~~*[OSHPD 1, 1R, 2, 3, 4 & 5]* and *Table 4-A*~~ shall be designed to have ventilation (outdoor) air for occupants in accordance with this chapter. ***[DSA-SS & DSA-SS/CC]*** *Ventilation air requirements for occupancies regulated by the California Energy Commission are found in the California Energy Code.*
[OSHPD 1, 2, 3, 4 & 5] *Health care spaces shall meet the ventilation requirements found in Table 4-A.*
(relocated from 402.1.2)*Ventilation rates for areas not specified in Table 4-A shall have minimum ventilation and air change rates per ANSI/ASHRAE Standard 62.1. Where areas with prescribed ventilation rates in both Standards 62.1 and Table 4-A exist, the higher of the two air change rates shall be used.*

Section 402.1.2 – Ventilation in Health Care Facilities

402.1.2 Ventilation in Health Care Facilities.
Mechanical ventilation for health care facilities shall be designed and installed in accordance with this code and ASHRAE 170. ***[OSHPD 1, 1R, 2, 3, 4 & 5]]*** *Ventilation for health care facilities shall be designed and installed in accordance with this code and Table 4-A. ~~-2013, through Addendum ae.~~*
(relocate to 402.1) Ventilation rates for areas not specified in Table 4-A shall have minimum ventilation and air change rates per ANSI/ASHRAE Standard 62.1.Where areas with prescribed ventilation rates in both Standards 62.1 and Table 4-A exist, the higher of the two air change rates shall be used.
(Keep)All supply-air, return air, and exhaust-air systems shall comply with this code and ASHRAE 170. The text of ASHRAE 170 shall be modified as follows:

. . .

Section 406.0 – Evaporative Cooling

406.0 Evaporative Cooling System for Health Care Facilities. [For OSHPD 1, ~~1R~~, 2, 3, 4 & 5] *Direct evaporative cooling systems where the air directly contacts the wetted surface or spray shall be limited in health facilities to nonpatient areas such as laundry rooms, ~~food preparation areas~~, and boiler or machinery rooms. Similar rooms with high heating-producing equipment will be considered when specifically approved by the enforcing agency. The evaporative pads shall be a synthetic type. Filters shall be required in accordance with Tables 4-B and 4-C except utility rooms, i.e.: boiler or machinery rooms.*

407.0 – Ventilation System Details

407.0 Ventilation System Details. [OSHPD 1, ~~1R~~, 2, 3, 4 & 5]
407.1 General.
407.1.1 *All supply-air, return air, and exhaust-air systems shall be mechanically operated and such systems for areas listed in Table 4-A shall be operated continuously. Natural ventilation through windows or other openings such as louvers will be considered as supplemental to the required mechanical ventilation systems.*
Exceptions:
(1) Natural ventilation shall not be used in airborne infection isolation rooms and protective environment rooms.
(2) Unoccupied turndown shall be permitted in accordance with section 407.7. ~~The number of air changes may be reduced to 25 percent of the indicated value in Table 4-A, when the room is unoccupied, if provisions are made to ensure the following:~~
~~(1) The number of air changes per hour indicated is reestablished whenever the space is occupied.~~
~~(2) The pressure relationship with the surrounding rooms is maintained when the air changes per hour are reduced. In areas requiring no continuous directional control as identified in accordance with Table 4-A, ventilation systems may be shut down when the space is unoccupied and ventilation is not otherwise required. Ventilation shall not be reduced in rooms specifically used for airborne infection control, such as waiting rooms, triage rooms, corridors, reception areas, areas adjacent to waiting areas, airborne infection isolation rooms, negative pressure exam room, negative pressure x-ray treatment rooms, and protective environment rooms. All operating and delivery rooms shall maintain a minimum of six air changes per hour of total air when not in use.~~

407.2.2 – Exhaust Outlets

407.2.2 Exhaust Outlets. *Exhaust outlets shall be located a minimum of 10 feet (3048 mm) above adjoining grade and 10 feet (3048 mm) from doors, occupied areas, and operable windows.*
Exception: *Airborne infection isolation rooms shall comply with Section 414.1.*
407.2.2.1 Hazardous Exhaust Outlets. *Hazardous exhaust outlets from airborne infection isolation rooms, bronchoscopy and sputum collection exhaust, hazardous drug compounding, morgues, autopsy rooms and laboratory chemical fume hoods shall discharge a minimum of 10' above the adjacent roof surface and a minimum of 30 feet from outdoor air intakes, building openings and areas normally accessible to the public.*

407.3 – Air Balance

407.3 Air Balance.
407.3.1 *The ventilation systems shall be designed and balanced to provide the general air balance relationship to adjacent areas, shown in Table 4-A. The ventilation systems shall be balanced in accordance with the latest edition of standards published by the Associated Air Balance Council (AABC), the National Environmental Balancing Bureau (NEBB), or the Testing, Adjusting and Balancing Bureau (TABB). Air balance tolerancing values shall not result in noncompliance of the minimum required pressurization per Table 4-A.*

407.4 – Air Circulation

407.4 Air Circulation.
407.4.1 *Design of the ventilation system shall provide air movement that is generally from clean to less clean areas.*
407.4.1.1(formerly 420.0) ~~*420.0 Air Distribution Devices [OSHPD 1, 2, 3, 4, 5]*~~ *All air distribution devices and supply air outlets shall meet the requirements of ASHRAE 170~~-2013~~, Section 6.7.2 and Table ~~6.7.2~~6-2.*
407.4.1.2*(formerly* ***407.4.1.6)*** *Supply outlets and return and exhaust air inlets shall be located to prevent short-circuiting.*
407.4.1.3(formerly 407.4.1.1) *Air supplied to operating rooms, cesarean operating rooms, cardiac catheterization labs, cystoscopy rooms, delivery rooms, and class 3 imaging shall be delivered by a primary supply diffuser array in accordance with ASHRAE 170, 7.4.1* (reworded and relocated to 407.4.1.5 and 407.4.1.6) ~~*at the ceiling of the area served. In these areas and in morgues and autopsy rooms all air removed from the area shall be removed near floor level. Exhaust or recirculation inlets shall be located not less than 3 inches (76 mm) nor more than 8 inches (203 mm) above the finished floor, except in morgues and autopsy rooms where all of the exhaust air is removed through an autopsy table designed for this purpose. At least two exhaust or recirculation air inlets of equal capacity shall be used in all cardiac catheterization labs, cystoscopy rooms, operating rooms, and delivery rooms and shall be located not less than 3 inches (76 mm) nor more than 8 inches (203 mm) above the finished floor.*~~

407.4 – Air Circulation

~~***Exception:*** *For airborne infection isolation rooms and protective environment rooms, see Sections 414.0 and 415.0.*~~

407.4.1.4 *Air supplied to procedure rooms and class 2 imaging shall be delivered over the patient table. Return or exhaust inlets shall be located at the perimeter of the room on a minimum of two sides to provide air movement from clean to less clean.*

407.4.1.5 (from 407.4.1.1) *At least two exhaust or recirculation air inlets of equal capacity shall be provided on opposite corners in all operating rooms, cesarean operating rooms, cardiac catheterization labs, cystoscopy rooms, delivery rooms and class 3 imaging. All air inlets in the room shall be located not less than 3 inches (76 mm) nor more than 8 inches (203 mm) above the finished floor.*

407.4.1.6 (from 407.4.1.1) *Morgues and autopsy rooms shall exhaust air through an autopsy table designed for this purpose or through low sidewall exhaust inlets located not less than 3 inches nor more than 8 inches above the finished floor.*

407.4 – Air Circulation

~~407.4.1.3~~407.4.2 *Corridors shall not be used to convey supply, return, transfer or exhaust air to or from any room ~~if the corridor is required to be fire resistive construction~~ per the California Building Code.*

Exceptions:

(1) ~~Mechanically exhausted toilet rooms of 50 square feet (4.7 m2) or less and small rooms of 30 square feet (2.79 m2) or less such as janitor closets, housekeeping rooms, and electrical or telephone closets opening directly onto corridor.~~ Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors is permitted where allowed by the California Building Code. The corridor air balance shall be equal based on the total net transfer air to or from the corridor.

(2) Air transfer caused by pressure differentials in rooms required to have a positive or negative air balance by Table 4-A.

~~407.4.1.4~~407.4.3 *No space above a ceiling may be utilized…*

~~407.4.1.5~~407.4.4 *Air from a patient room, exam room, treatment…*

~~407.4.1.6~~(relocate to 407.4.1.1)

407.4 – Air Circulation

***~~407.4.1.7~~407.4.5* Recirculating Room Units.** *~~For spaces where Table 4-A permits air to be recirculated by room units, the portion of the minimum total air changes per hour required for a space that is greater than the minimum outdoor air changes per hour required component may be provided by recirculating room HVAC units. Such recirculating room HVAC units shall~~ Recirculating room units shall be permitted to provide a portion of the total air changes for a space in excess of the minimum outside air changes where indicated with a "yes" in the "Room Units" column of Table 4-A. The following conditions shall be met:*

(1) shall not receive nonfiltered, nonconditioned outdoor air;

(2) shall serve only a single space; and

(3) provide minimum MERV 8 filtration upstream of ~~per Section 408.2 and Section 408.3 for airflow passing over~~ any surface that is designed to condense water. ~~This filter shall be located upstream of any such cold surface, so that all of the air passing over the cold surface is filtered.~~

(4)Coils designed not to condense water shall maintain surfaces above the dew point temperature.

***407.4.5.1 Recirculating Room Units for Unoccupied spaces.** For spaces not listed in Table 4-A and do not directly connect to a patient care area, the minimum filtration for a recirculating room unit may be as recommended by the equipment manufacturer.*

407.5 Variable Air Volume

407.5.1.3 *Spaces with pressure requirements per Table 4-A shall utilize an automatic modulating damper in the return or exhaust air for each space. The damper will modulate from full open to minimum position in conjunction with the supply air VAV terminal equipment to maintain space pressurization.*

407.5.1.4 *Sensitive rooms or areas shall be provided with an automatic modulating damper on the supply and on the return or exhaust air for each space.*

407.5.1.5 *NR spaces per Table 4A shall utilize a modulating damper in the return air for each zone or zones with similar conditions.*

407.6 - Economizers

407.6 Economizers.
407.6.1*Systems with economizers shall include modulating relief and/or return fans to ensure compliance with the pressure requirements of spaces listed in Table 4-A.*

407.7 – Unoccupied Turndown

407.7 Unoccupied Turndown.

407.7.1 *Where indicated with a "yes" in the Unoccupied turndown column of Table 4-A, the number of air changes shall be permitted to be reduced. The following conditions shall be met:*

1) *The number of air changes may be reduced to 25 percent of the indicated value in Table 4-A for pressurized spaces when the room is unoccupied.*
2) *The number of air changes per hour indicated is reestablished whenever the space is occupied.*
3) *The pressure relationship with surrounding rooms is maintained when the air changes per hour are reduced.*
4) *All operating, class 3 imaging and cesarean delivery rooms shall maintain a minimum of six air changes per hour of total air when not in use.*

407.8 – Building Pressurization

407.8 Building Pressurization

407.8.1 *The outdoor air intake design for air handling systems shall be set to maintain the intake air rate to equal or exceed the building exhaust under all conditions including variable air volume and unoccupied turndown.*

408.0 - Filters

408.0 Filters.

. . .

408.1.5 *Filter bank No. 1 shall be located upstream of the air-conditioning equipment. Filter bank No. 2 ~~and filter bank No. 3~~ shall be located downstream of the supply fan and all cooling and humidification equipment with efficiencies as indicated in Table 4-B or Table 4-C.*

Exception: *Humidifiers for local room humidity control may be installed in the supply air duct downstream of the final filter bank where designs are specifically approved by the enforcing agency. Humidification shall be in accordance with 320.1.1.*

408.1.6 *Filter bank No. 2 ~~and filter bank No. 3~~ media shall be rigid or supported (noncollapsing type) and shall operate on the principles of impingement, straining, and diffusion. Filter bank No. 2 shall have sealing interface surfaces.*

408.1.7 *HEPA filtration, where required by Table 4-B, shall be provided at the terminal device outlet.*

408.0 - Filters

408.2 Filters for Hospitals.

408.2.1 *All air-ventilation systems shall comply with code requirements of this section and shall have filter bank efficiencies as listed in Table 4-B.*

~~***408.2.2*** *Noncentral recirculating air systems providing cooling to high heat producing equipment located in nonsensitive areas shall have a filter with minimum efficiency reporting value (MERV) of 6 based on ASHRAE 52.2.*~~

~~***408.2.3*** *Noncentral air systems serving any areas not listed in Table 4-B shall have a filter with minimum efficiency reporting value (MERV) of 6 based on ASHRAE 52.2.*~~

~~***408.2.4*** *Noncentral recirculating air handling systems, for example, through-the-wall units, fan coil units, and heat pumps may be utilized for single patient rooms of one or more beds. Filtration for these units shall have a filter with minimum efficiency reporting value (MERV) of 6, based on ASHRAE 52.2. The air ventilation system providing the minimum air changes of outdoor air shall comply with Table 4-B. These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air handling system.*~~

408.0 - Filters

408.3 Filters for Skilled Nursing Facilities, Intermediate Care Facilities, and Correctional Treatment Centers.

408.3.1 *The air ventilation systems ~~shall comply with code requirements of this section~~ for skilled nursing facilities, intermediate care facilities and correctional treatment centers ~~and~~ shall have filter bank efficiencies as listed in Table 4-C.*

~~***408.3.2*** *Noncentral air systems serving single patient rooms of one or more beds shall comply with Table 4-C.*~~

~~***408.3.3*** *Noncentral recirculating air-handling systems, i.e. through the wall units, may be utilized for each patient room with one or more beds. Filtration for these units shall have a filter with minimum efficiency reporting value (MERV) of 6, based on ASHRAE 52.2. The air ventilation system providing the minimum air changes of outdoor air shall comply with Table 4-C. These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air handling system.*~~

408.3.4~~2~~ *Airborne infection isolation rooms, protective environment rooms, and sensitive areas in correctional treatment centers shall comply with Section 408.2.*

408.0 - Filters

408.4 Filters for Outpatient Facilities.
408.4.1 *The air ventilation systems ~~shall comply with code requirements of this section~~ for outpatient facilities ~~and~~ shall have filter bank efficiencies as listed in Table 4-B.*
~~***408.4.2*** *Noncentral recirculating room units shall have a filter with minimum efficiency reporting value (MERV) of 6 based on ASHRAE 52.2.*~~

408.0 - Filters

408.5 Filters for Recirculating Room Units

408.5.1 *Filters for recirculating room units shall comply with Section 407.4.5. Where Table 4A does not permit air recirculated by means of room units, room units with filtration per Table 4-B are permitted.*

409.0 - Ducts

~~***409.3 Insulation of Ducts.*** *Cold air ducts shall be insulated wherever necessary or to prevent condensation.*~~

414.0 – Airborne Infection Isolation

414.1.1 *Exhaust discharge from fan shall extend at least ~~7~~10 feet (2134 mm) above the roof and discharge vertically upward. Self-draining stacks or equivalent shall be used for rain protection. Rain caps which divert the exhaust toward the roof shall be prohibited.*

417.0 Testing and Balancing AIIR and PE

417.0 Testing and Balancing Airborne Infection Isolation Rooms and Protective Environment Rooms.
[OSHPD 1, 2, 3, 4 & 5] *Prior to acceptance of the rooms, all mechanical systems shall be tested, balanced, and operated to demonstrate to the owner or designated representative that the installation and performance of the systems conform to design intent. All testing and balancing shall be performed by a qualified independent agency certified by the Associated Air Balance Council (AABC): the National Environmental Balancing Bureau (NEBB); or the Testing, Adjusting and Balancing Bureau (TABB). Air balance testing shall include a pressure test at all doors serving the isolation and ante rooms.*

420.0 – Air Distribution Devices

~~*420.0 Air Distribution Devices. [OSHPD 1, 2, 3, 4 & 5]*~~***(relocate to 407.4.1.1)*** *All air distribution devices and supply air outlets shall meet the requirements of ASHRAE 170-2013, Section 6.7.2 and Table 6.7.2.*

Table 4-A - Current

FUNCTION OR SPACE	PRESSURE RELATIONSHIP TO ADJACENT AREAS (f) (n)	MINIMUM OUTDOOR ACH	MINIMUM TOTAL ACH	ALL ROOM AIR EXHAUSTED DIRECTLY TO OUTDOORS (j)	AIR RECIRCULATED BY MEANS OF ROOM UNITS (a)	DESIGN RELATIVE HUMIDITY(k), %	DESIGN TEMPERATURE (l),oF/oC
Cardiac catheterization lab	*Positive*	*3*	*15*	*NR*	*No*	*max 60 -*	*70-75/21-24*
Class 2 imaging (d), (p)	*Positive*	*3*	*15*	*NR*	*No*	*max 60 -*	*70-75/21-24*
Class 3 imaging (m), (o)	*Positive*	*4*	*20*	*NR*	*No*	*20-60*	*68-75/20-24*
Critical and intensive care *(ac)*	NR	2	6	NR	No	30-60	70-75/21-24
Delivery room (caesarean) (m), (n), (o)	Positive	4	20	NR	No	20-60	68-75/20-24
Electroconvulsive therapy pro-cedure room	*Positive*	*3*	*15*	*NR*	*No*	*20-60*	*70-75/21-24*
Gastrointestinal endoscopy pro- cedure room (x)	NR	2	6	NR	No	20-60	68-73/20-23
Interventional imaging procedure room	*Positive*	*5*	*15*	*NR*	*No*	*20-60*	*70-75/21-24*
Laser eye room	Positive	3	15	NR	No	20-60	70-75/21-24
Newborn intensive care	Positive	2	6	NR	No	30-60	72-78/22-26
Newborn/*well baby* nursery suite	NR	2	6	NR	No	30-60	72-78/22-26
Operating room, *hybrid operating room* (m), (n), (o)	Positive	4	20	NR	No	20-60	68-75/20-24
Operating/surgical cystoscopic room (m), (n), (o)	Positive	4	20	NR	No	20-60	68-75/20-24

Table 4A - Proposed

Function of Space (ee)	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	Unoccupied Turndown	~~Minimum Filter Efficiencies (ee)~~	Design Relative Humidity (k), %	Design Temperature (1), °F/°C
NURSING UNITS AND OTHER PATIENT CARE AREAS									
All anteroom *(FGI 2.1-2.4.2.3)* (u)	(e)	NR	10	Yes	No	~~Yes~~ *No*	~~MERV-8 *14*~~	NR	NR
All room *(FGI 2.1-2.4.2)* (u)	Negative	2	12	Yes	No	~~Yes~~ *No*	~~MERV-14~~	Max 60	70-75/21-24
Airborne infection isolation treatment/exam room	*Negative*	*2*	*12*	*Yes*	*No*	*No*	~~*MERV-14*~~	*max 60*	*70-75/21-24*
Cesarean Delivery room *(FGI 2.2-2.9.I I. I)* (m), (o)	Positive	4	20	NR	No	Yes	~~MERV-16~~	20-60	68-75/20-24
Combination Afl/PE anteroom *(FGI 2.2-2.2.4.5)*	(e)	NR	10	Yes	No	No	~~HEPA~~	NR	NR
Combination All/PE room *(FGI 2.2-2.2.4.5)*	Positive	2	12	Yes	No	No	~~HEPA~~	Max 60	70-75/21-24
Continued care nursery *(FGI 2.2-2.10.3.2)*	N/R	2	6	NR	No	Yes	~~MERV-14~~	30-60	72-78/22-26
Critical care patient care station *(FGI 2.2-2.6.2)*	NR	2	6	NR	No	Yes	~~MERV-14~~	30-60	70-75/21-24
Emergency department exam/treatment room *(FGI 2.2-3.12.6 & 2.2-3.1.3.6)* (p)	NR	2	6	NR	NR	Yes (fl)	~~MERV-14~~	Max 60	70-75/21-24
Emergency department human decontamination (FGI 2.2-3.l.3.6{8})	Negative	2	12	Yes	No	~~Yes (fl)~~ *No*	~~MERV-14~~	NR	NR
Emergency department public waiting area (FGI 2.2-3.1.2.4 & 2.2-3./.3.4)	Negative	2	12	Yes (q)	NR	~~Yes (fl)~~ *No*	~~MERV-8 *14*~~	Max 65	70-75/21-24
Emergency department trauma/resuscitation room *(FGI 2.2-3.1.3.6[4])*(c)	Positive	3	15	NR	No	Yes	~~MERV-14~~	20-60	70-75/21-24
Emergency service triage area *(FGJ 2.2-3.J .3.3)*	Negative	2	12	Yes (q)	NR	~~Yes (fl)~~ *No*	~~MERV-8 *14*~~	Max 60	70-75/21-24
Fast track room	*NR*	*2*	*6*	*NR*	*NR*	*Yes*	~~*MERV-14*~~	*NR*	*70-75/21-24*
Infusion room	*Positive*	*2*	*6*	*NR*	*NR*	*Yes*	~~*MERV-14*~~	*NR*	*70-75/21-24*

Table 4-A - proposed

Function of Space (ee)	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	Unoccupied Turndown	~~Minimum Filter Efficiencies (ee)~~	Design Relative Humidity (k), %	Design Temperature (1), °F/°C
DIAGNOSTIC AND TREATMENT									
Bronchoscopy, sputum collection, and pentamidine administration *(FGI 2.2-3.9.2)* (n), (x)	Negative	2	12	Yes	No	Yes	~~MERV-14~~	NR	68-73/20-23
Class 1 imaging room *(FGI 2.2-3.4.1.2 & Table 2.2-2)*	NR (jj)	2	6	NR	NR	Yes	~~MERV-8~~	Max 60	72- 78/22-26
CT Scan	*NR*	*2*	*6*	*NR*	*NR*	Yes	~~MERV-14~~	*max 60*	*70-75/21-24*
Fluoroscopy room	*Negative*	*2*	*6*	*Yes*	*No*	Yes	~~MERV-14~~	*NR*	*70-75/21-24*
MRI room	*NR*	*2*	*6*	*NR*	*NR*	Yes	~~MERV-14~~	*NR*	*70-75/21-24*
Negative-pressure x-ray room	*Negative*	*2*	*12*	*Yes*	*No*	Yes	~~MERV-14~~	*max 60*	*72-78/22-26*
Class 2 imaging room *(FGI 2.2-3.4.l.2 & Table 2.2-2)* (d), (p)	Positive	3	15	NR	No	Yes	~~MERV-14~~	Max 60	70-75/21-24
Angiography room	*Positive*	*3*	*15*	*NR*	*No*	Yes	~~MERV-14~~	*max 60*	*70-75/21-24*
Cardiac catheterization lab	*Positive*	*3*	*15*	*NR*	*No*	Yes	~~MERV-14~~	*max 60*	*70-75/21-24*
Electroconvulsive therapy procedure room	*Positive*	*3*	*15*	*NR*	*No*	Yes	~~MERV-14~~	*20-60*	*70-75/21-24*
Interventional imaging procedure room	*Positive*	*5*	*15*	*NR*	*No*	Yes	~~MERV-14~~	*20-60*	*70-75/21-24*
Class 3 imaging room *(FGJ 2.2-3.4.1.2 & Table 2.2-2)* (m), (o)	Positive	4	20	NR	No	Yes	~~MERV-16 (hh)~~	20-60	68-75/21-24
Hybrid operating room (m), (n), (o)	Positive	4	20	NR	No	Yes	~~MERV-16 (hh)~~	20-60	68-75/20-24
Dialysis treatment area *(FGI 2.2-3.10.2)*	NR	2	6	NR	NR	Yes	~~MERV-8 *14*~~	NR	72-78/22-26
Dialyzer reprocessing room *(FGI 2.2-3.10.8.16)*	Negative	NR	I0(bb)	Yes	No	Yes (fl)	~~MERV-8 *14*~~	NR	NR

Table 4-B

[OSHPD 1, 3, & 5]TABLE 4-B
FILTER EFFICIENCIES FOR CENTRAL VENTILATION AND AIR-CONDITIONING SYSTEMS IN GENERAL ACUTE CARE HOSPITALS, ACUTE PSYCHIATRIC HOSPITALS, OUTPATIENT FACILITIES AND LICENSED CLINICS[1]

AREA DESIGNATION	***MINIMUM NUMBER OF FILTER BANKS***	***FILTER EFFICIENCY % FILTER ~~BANK~~LOCATION (MINIMUM EFFICIENCY REPORTING VALUE MERV)~~5~~6***		
		NO. 1[1]	***NO. 2[1]***	***~~NO. 3~~T.D.[1]***
Orthopedic operating room, bone marrow transplant operating room, organ transplant operating room, NICU formula preparation room, NICU treatment area/room	*3*	*30%*	*90%*	*99.97%~~3~~4*
		(8)	*(14)*	*~~(17)~~HEPA[3]*
Protective environment rooms	*3*	*30%*	*90%*	*99.97%~~4~~5*
		(8)	*(14)*	*~~(17)~~HEPA[3]*

Table 4-B

AREA DESIGNATION	MINIMUM NUMBER OF FILTER BANKS	FILTER EFFICIENCY % FILTER ~~BANK~~LOCATION (MINIMUM EFFICIENCY REPORTING VALUE MERV)~~5~~6		
		NO. 1[1]	NO. 2[1]	~~NO. 3~~T.D.[1]
Orthopedic operating room, bone marrow transplant operating room, organ transplant operating room, NICU formula preparation room, NICU treatment area/room	3	30%	90%	99.97%~~3~~4
		(8)	(14)	~~(17)~~HEPA3
Protective environment rooms	3	30%	90%	99.97%~~4~~5
		(8)	(14)	~~(17)~~HEPA3

1 Based on ASHRAE 52.2, T.D. –Terminal Device
2 Based on DOP test in accordance with MIL-STD-282 or based on ASHRAE 52.2.
3 HEPA filters are those filters that remove at least 99.97% of 0.3 micron sized particles at the rated flow in accordance with the testing methods of IEST RP CC001.3
~~3~~4 HEPA filters shall be located ~~at~~ in the air terminal device ~~outlet or other locations when approved by the Authority Having Jurisdiction~~.
~~4~~5 HEPA filters shall be located in the air terminal device of the room served. ~~supply duct which serves the positive-pressure isolation room or rooms may serve more than one supply outlet and more than one positive-pressure isolation room.~~ HEPA filter ~~or a filter with minimum efficiency reporting value (MERV) of 17~~ installation shall be designed and equipped to permit safe removal, disposal and replacement of filters.
~~5~~6 The numbers in parentheses represent MERV rating based on ASHRAE 52.2.
~~6~~7. Additional prefilters with a minimum efficiency of MERV 8 may be used to reduce maintenance for filters.

Table 4-C

[OSHPD 2 & 5]TABLE 4-C
FILTER EFFICIENCIES FOR CENTRAL VENTILATION AND AIR-CONDITIONING SYSTEMS IN SKILLED NURSING FACILITIES AND INTERMEDIATE CARE FACILITIES AND CORRECTIONAL TREATMENT CENTERS[1]

AREA DESIGNATION	MINIMUM NUMBER OF FILTER BANKS	FILTER EFFICIENCY % FILTER BANK (MINIMUM EFFICIENCY REPORTING VALUE MERV)[3]	
		NO. 1[1]	NO. 2[1]
All areas for inpatient care, treatment and/or diagnosis, and those areas providing direct service or cleaning supplies	*2*	*30%*	*80%*
		(8)	*(13)*
Administrative, bulk storage, soiled holding, laundries and food prep areas	*1[4]*	*80%[2]*	—
		(13)	—

1 *Based on ASHRAE 52.2.*
2 *Filters are not required for evaporative coolers serving laundries and food preparation areas.*
3 *The numbers in parentheses represent MERV rating based on ASHRAE 52.2.*
4 *Additional prefilters with a minimum efficiency of MERV 8 may be used to reduce maintenance for filters.*

603.4 – Flexible Air Ducts

603.4.1 Length Limitation. ***[Not permitted for OSHPD 1, ~~1R,~~ 2, 3, 4 & 5]*** Flexible air ducts shall be not more than 5 feet (1524 mm) in length and shall not be used in lieu of rigid elbows or fittings. Flexible air ducts shall be permitted to be used as an elbow at a terminal device.
Exception: Residential occupancies.
603.4.1.1 Flexible Ducts. [OSHPD 1, ~~1R,~~ 2, 3, 4 & 5] *In hospital building projects and all other health-care facilities, including clinics and correctional treatment centers, flexible ducts of not more than 10 feet (3048 mm) in length may be used to connect supply, return or exhaust-air terminal devices to rigid duct systems. Where constant volume, variable volume or mixing boxes are utilized, flexible duct of not more than ~~10~~5 feet (3048 mm), may be used on the inlet side for alignment. An internal impervious liner shall be provided to isolate insulation material from conditioned air. Flexible duct is not permitted in corridors where fire and/or smoke dampers are omitted per CBC 717.5.4 and the duct is required to be constructed of steel not less than 0.019inch in thickness.*

605.0 –Insulation of Ducts

605.2 [OSHPD 1, ~~1R, 2,~~ 3 (Surgical Clinics), 4 & 5] *Thermal acoustical lining materials shall not be installed within ducts, terminal boxes, sound traps, and other in-duct systems serving areas such as operating, cesarean operating rooms, delivery rooms, class 3 imaging, hybrid operating rooms, post anesthesia care units, cystoscopy, cardiac catheterization labs, nurseries, intensive care units, newborn intensive care units, protective environment rooms and airborne infection isolation rooms unless filters with 90 percent average efficiency based on ASHRAE Standard 52.2 or minimum efficiency rating value (MERV) of 14 are installed downstream of the duct lining. See ASHRAE 170, section 6.9 for duct lining for non-sensitive spaces.*

605.3 [OSHPD 1, ~~1R,~~ 2, 4 & 5] *Thermal or acoustical lining materials shall not be installed within ducts which are downstream of the 99.97 percent high-efficiency particulate air (HEPA) filter ~~or with minimum efficiency rating value (MERV) of 17~~ required in Section 408.2.1 for protective environment rooms.*

Table 1104.1

TABLE 1104.1
PERMISSIBLE REFRIGERATION SYSTEMS[1]

OCCUPANCY GROUP3	HIGH-PROBABILITY SYSTEM	LOW PROBABILITY SYSTEM	MACHINERY ROOM
…	…	…	…
~~I-2.1~~	~~Group A1 only~~	~~Any~~	~~Any~~