



Midwest Healthcare Engineering Conference
14 November 2023

**ASHRAE Standard 170 –
Ventilation for Health Care Facilities, 2021 Edition**

170 UPDATE - AGENDA

- Introductions
- History of ASHRAE 170
- Major changes between 170-2017 and 170-2021 - **REDLINE**
- New / current directions
 - Highlights of 170 meetings
- Guideline 43
- Summary / Q & A

Laurence V. Wilson, PE, ASHRAE HFDP

- Analyses and Design/Construction: 41 years
- New & Renovation: Healthcare & Lab Projects
- ASHE, HESNI, ASPE, NSPE, NFPA
- ASHRAE:
 - Voting Member ASHRAE TC 9.6—Health Care
 - Corresponding Member ASHRAE Std 170
 - Judge: ASHRAE-IL Excellence in Engineering
- Presented at ASHE PDC, MWHCEC and HESNI
- Board member of HESNI



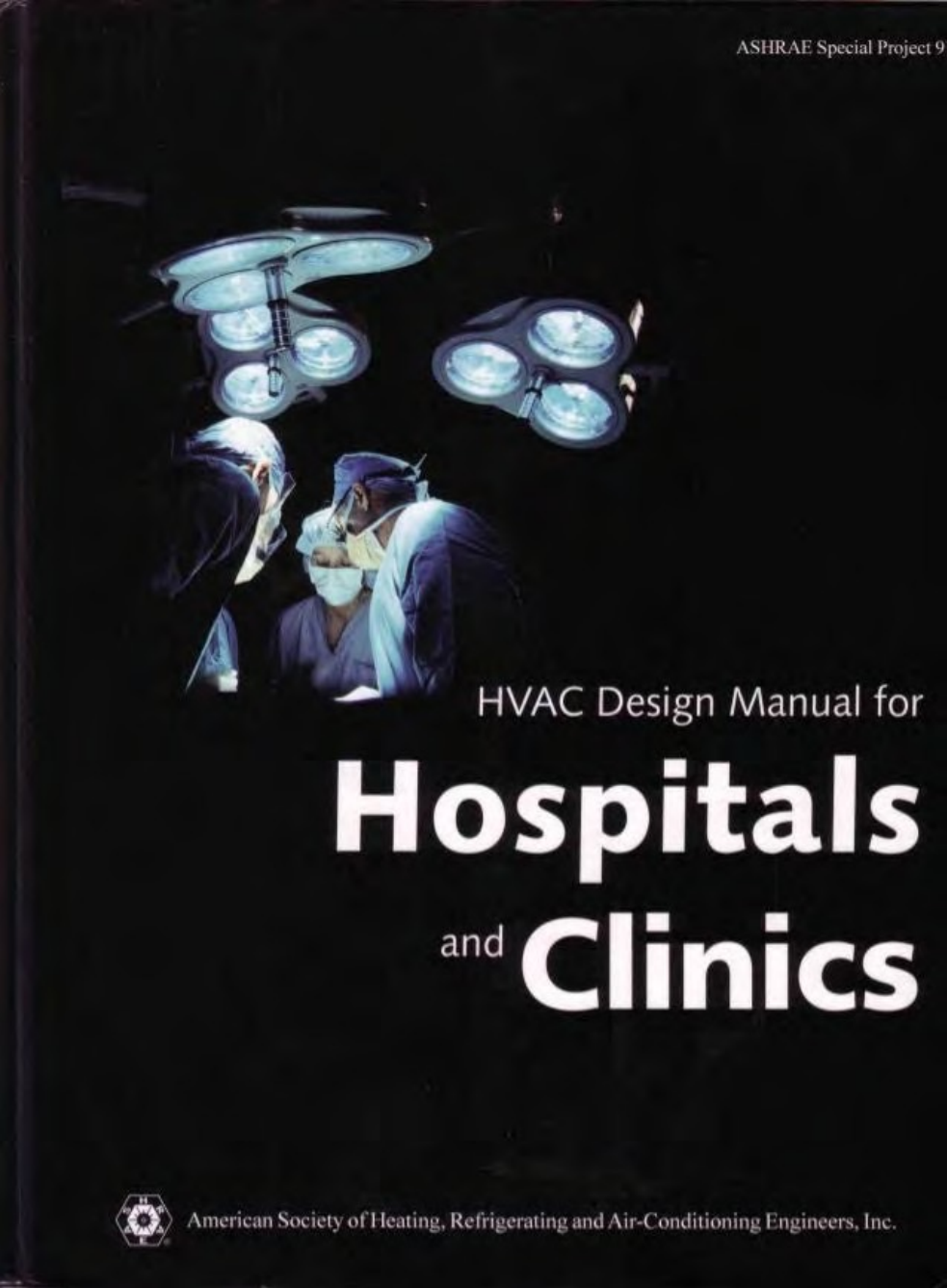
Kenneth A. Monroe, PE, MBA, CHC, PMP

- 25+ years in Healthcare “Bricks and Mortar”
 - Construction
 - Operations and Maintenance
 - Compliance: The Joint Commission
- ASHRAE
 - Standards Committee
 - Standard 170 Committee
 - Standard 202 Committee - Commissioning



Hospital Design Manual for Hospitals and Clinics, 2003

First Edition



The Problem – WHY was Standard 170 created?

- Risk: AHJ's (Authorities Having Jurisdiction) invoke ASHRAE HVAC Design Manual for Hospitals and Clinics similar to way invoke ASHRAE Applications Handbook
- KEY: These documents are **not** standards
 - Create confusion, problems or liability
- Standard incorporates new research and technology without new book.
- The Design Manual complements the Standard.

The Solution

- First jointly sponsored standard by ASHRAE and ASHE - 2008!
- Consensus standard
- "continuous maintenance"
- continuous maintenance = continuous improvement
- Written so easily invoked by AHJ's

ANSI/ASHRAE/ASHE Standard 170-2008

ASHRAE/ASHE STANDARD


Ventilation of Health Care Facilities

Approved by the ASHRAE Standards Committee on June 21, 2008; by the ASHRAE Board of Directors on June 25, 2008; by the American Society for Healthcare Engineering of the American Hospital Association on July 18, 2008; and by the American National Standards Institute on July 24, 2008.


This standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE Web site, <http://www.ashrae.org>, or in paper form from the Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 404-321-5478. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada).

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1791 Tullie Circle NE, Atlanta, GA 30329
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American Society for Healthcare Engineering of the American Hospital Association

Hospital Design Manual for Hospitals and Clinics, 2013 and ASHRAE Standard 170-2013

Second Edition

Of both documents published the same year—sync'd up
IS THE text = nfpa
handbook verbiage?

STANDARD

ANSI/ASHRAE/ASHE Standard 170-2013
(Supersedes ANSI/ASHRAE/ASHE Standard 170-2008)
Includes ANSI/ASHRAE/ASHE addenda listed in Appendix C

Ventilation of Health Care Facilities

See Appendix C for approval dates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, the ASHE Board of Directors, and the American National Standards Institute.

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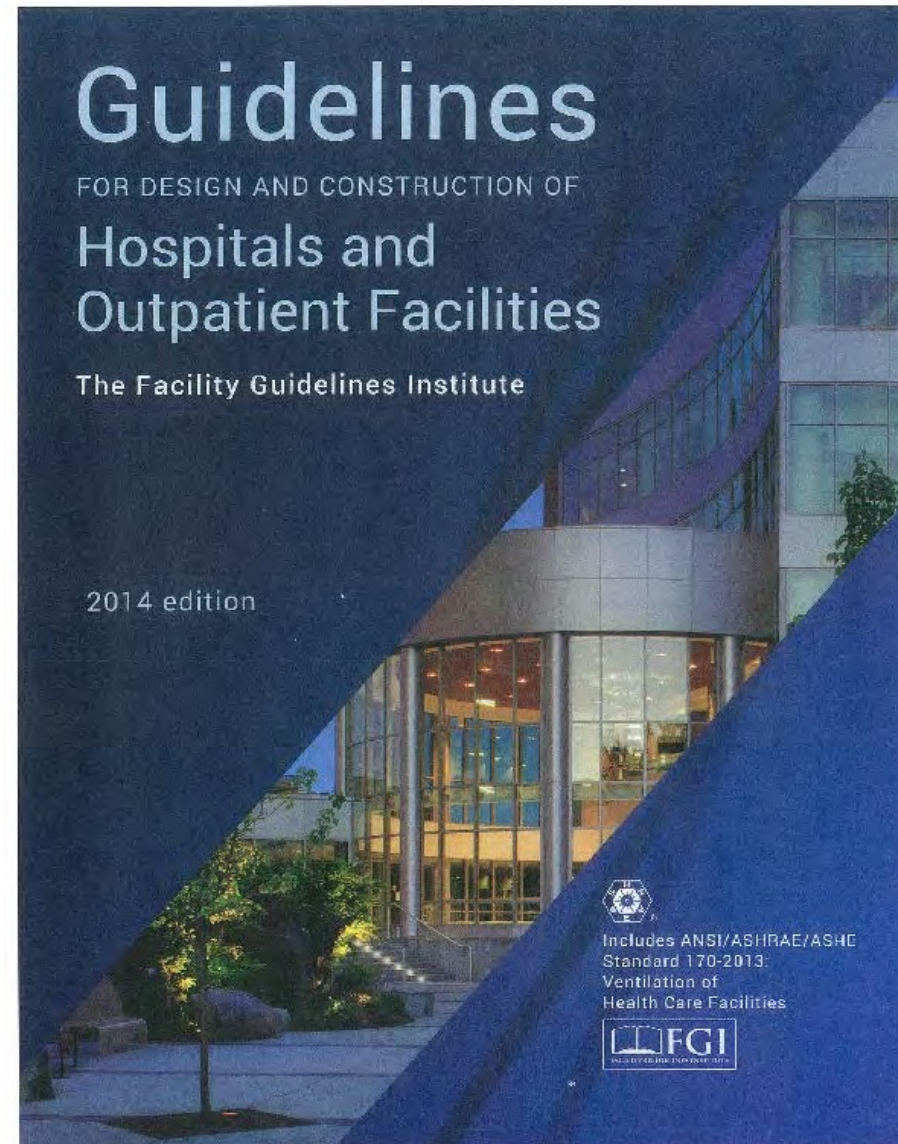
ASHRAE
American Society for Healthcare Engineering
of the American Hospital Association

ASHE
American Society for Healthcare Engineering
of the American Hospital Association

ANSI
Approved American National Standard
www.ansi.org

HVAC Design Manual for Hospitals and Clinics
Second Edition

FGI Guidelines 2014 incorporates Standard 170-2013



ANSI/ASHRAE/ASHE Standard 170-2013
(Supersedes ANSI/ASHRAE/ASHE Standard 170-2008)
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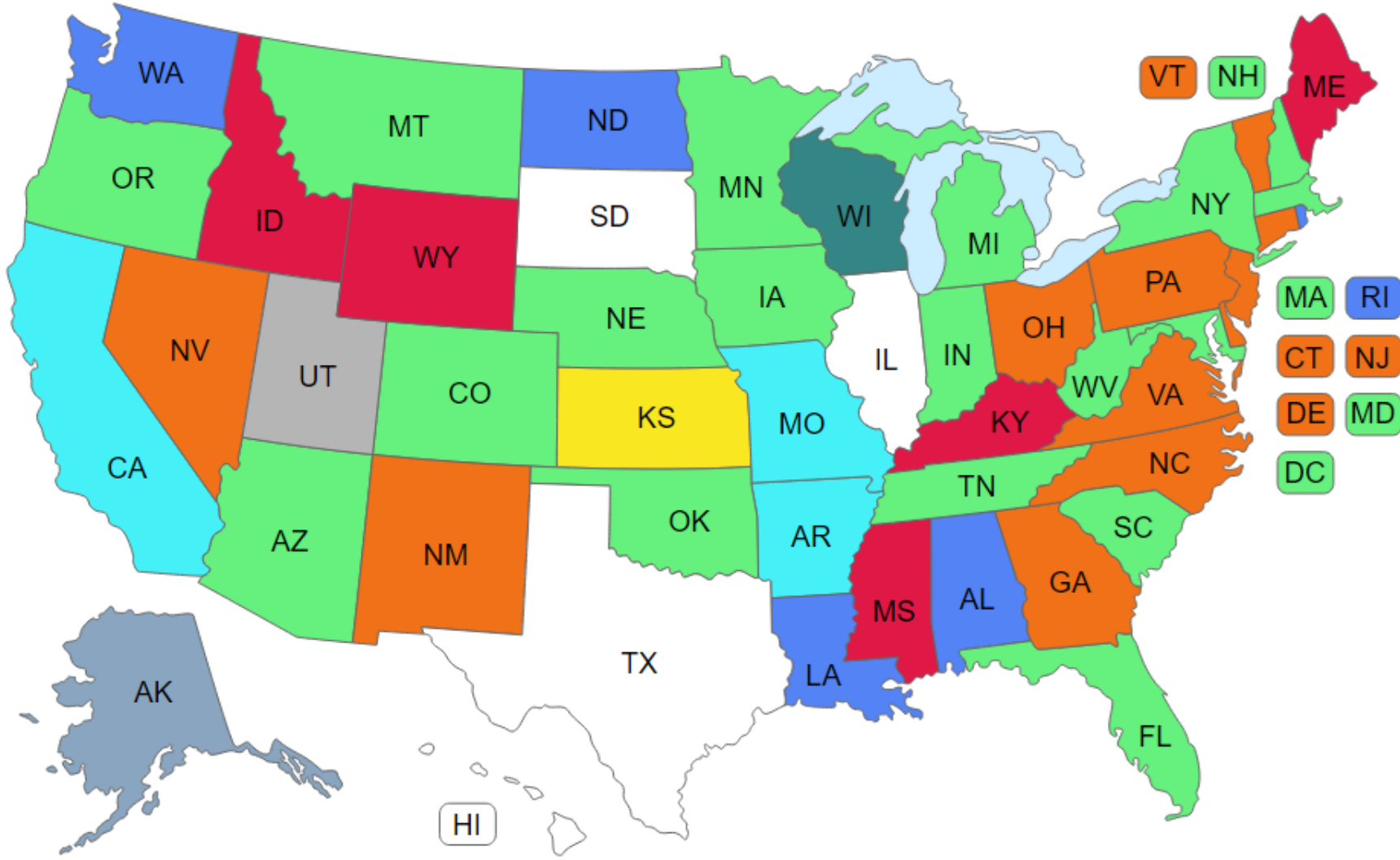


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HVAC Systems – Basis of Design – FGI adoptees

States that have adopted the FGI Guidelines and the edition year

Last updated 10/13/23



Key	
2022	Orange
2018	Light Green
2014	Blue
2010	Grey
2006	Red
2001	Light Blue
1996-97	Yellow
Equivalency*	Cyan
HVAC Only	Dark Teal

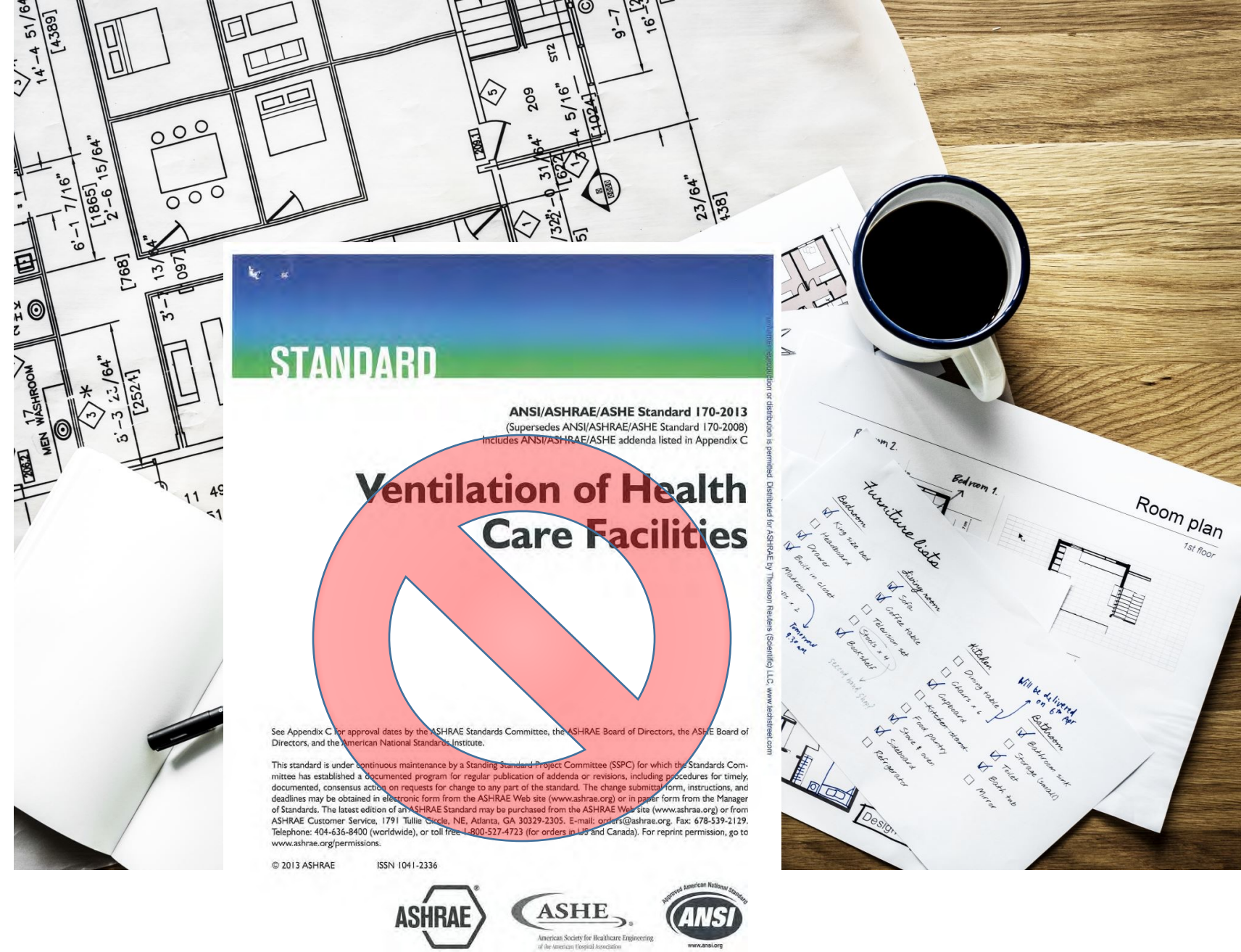
What 170 IS :

- Agreement between ASHRAE and FGI
 - 170 = Best location for Ventilation requirement
 - ASHE also included
 - FIRST standard jointly sponsored by ASHRAE and ASHE
- Set of MINIMUM requirements intended for Code Enforcing Agencies



What 170 is NOT :

- NOT a design guide
- NOT a COMFORT Guide:
Refer to ASHRAE Standard 55
 - 170:2.7 & Appendix B



Summary of Differences between 2017 and 2021 Editions of Standard 170

- Reference: **REDLINE** edition of Standard 170-2021, available from ASHRAE as downloadable .PDF or printed copy.
- Bread and Butter of the document:
 - Table 6-1, Intake relationships/distances
 - Table 7-1, Design Parameters, **Inpatient** Spaces - **revised**
 - Table 8-1, Design Parameters, **Specialized** Outpatient Spaces – **revised**
 - Table 8-2, Design Parameters, **General** Outpatient Spaces - **NEW**
 - Table 9-1, Design Parameters, **Residential Health, Care, and Support Specific Spaces** – **revised**
- **New** Sections for Outpatient (Section 8) & Residential (Section 9) to match the FGI Guidelines books.
- **Added** FGI section references to Rooms in Tables.

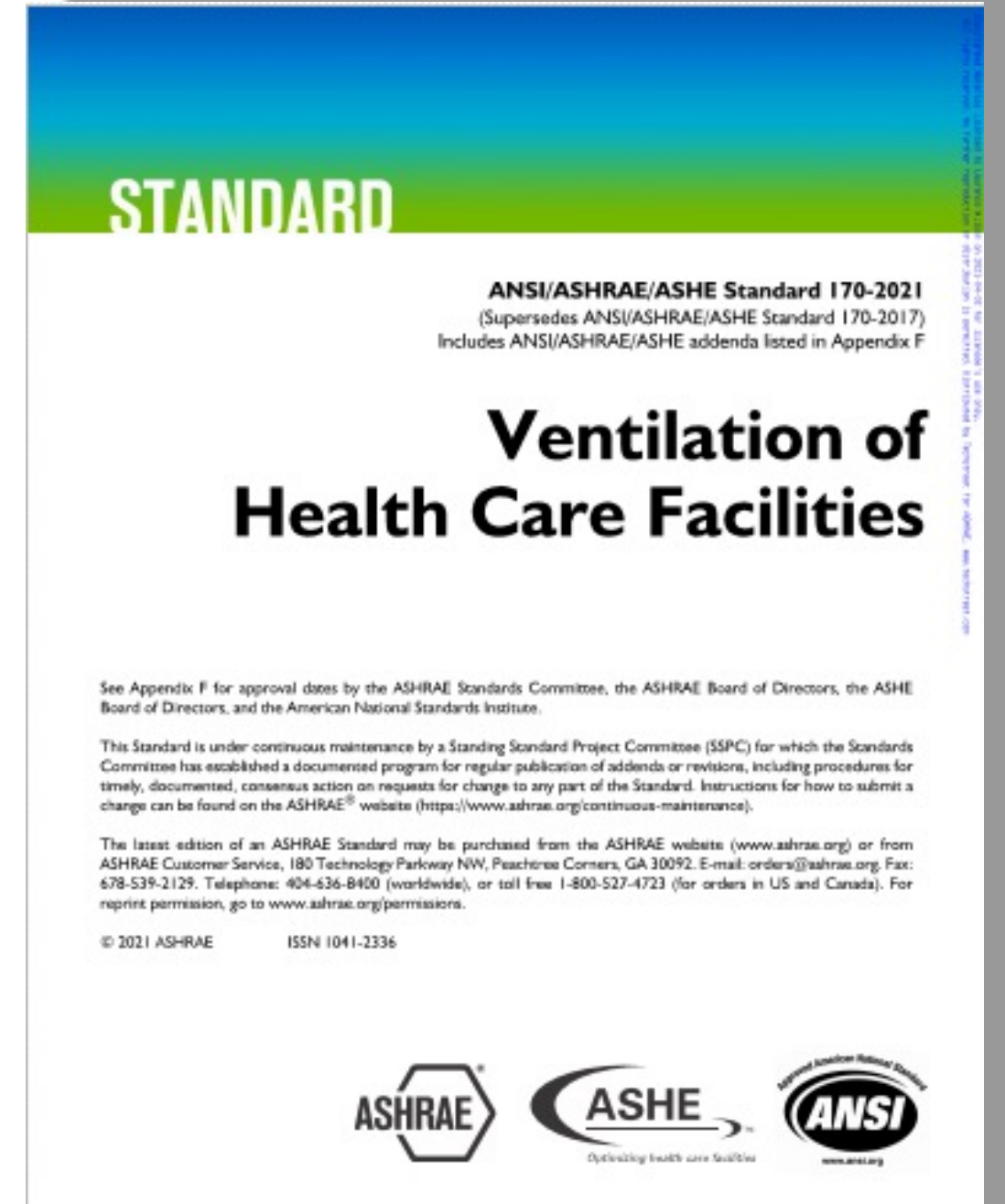
Improvements to the 2021 Edition of 170

- Improved guidance on **thermal comfort** conditions (**hint**: look elsewhere)
- Revised Outpatient and Residential sections
- **New** outpatient ventilation table: nonacute-type spaces
- Revisions to air filtration requirements
- **New** columns in vent tables: **filtration requirement and unoccupied turndown**
- **New** separation distance requirements for **intakes and exhausts**
 - coordinates with ASHRAE Standard 62.1 data (Table 6.1)
- Airborne infectious isolation **(All) room exhaust** to general exhaust
- **New** ventilation requirements: anesthetic gas use
- Clarification of **Class 1/Class 2/Class 3 imaging** in coordination with FGI
- **Revised definition of “invasive procedure”**
- **New** section: behavioral and mental health

1.0 Purpose

Purpose is to define HVAC system **design** requirements that provide **environmental control** in health care facilities.

- Planning
- Design
- Construction
- Operations
- Maintenance



2.0 Scope (broader over time)

Applies to **patient care areas, resident care areas and their related support areas** within:

- **Inpatient Facility** (hospitals)
- **Outpatient Facilities** (ASTC, MOB, free standing ED's, free standing birthing centers, etc.)
- **Residential Facilities** (nursing homes, etc.)



2.0 Scope

Applies to these kinds of projects:

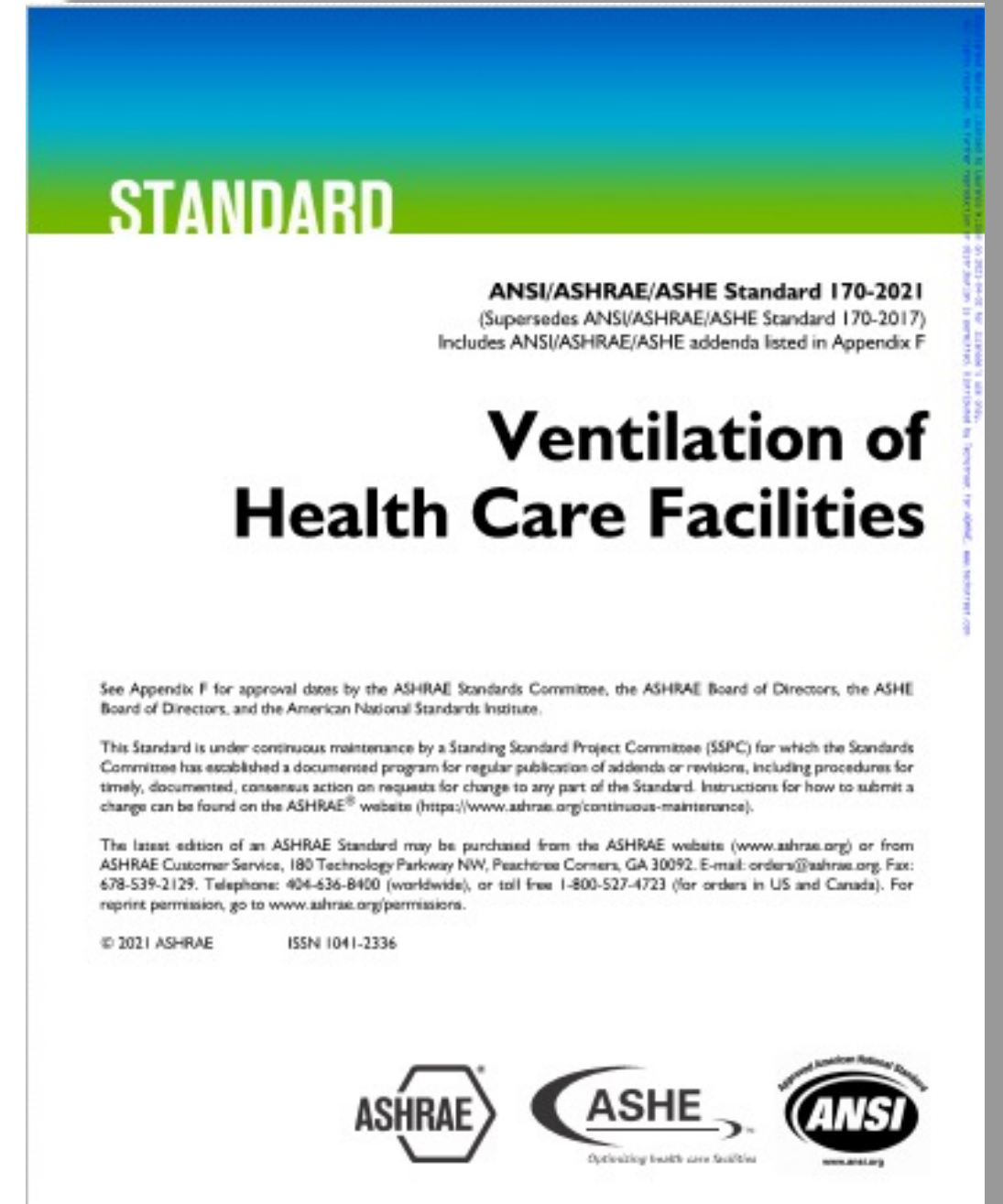
- New buildings
- Additions to existing buildings i
- Renovations of existing buildings
- Infrastructure upgrades



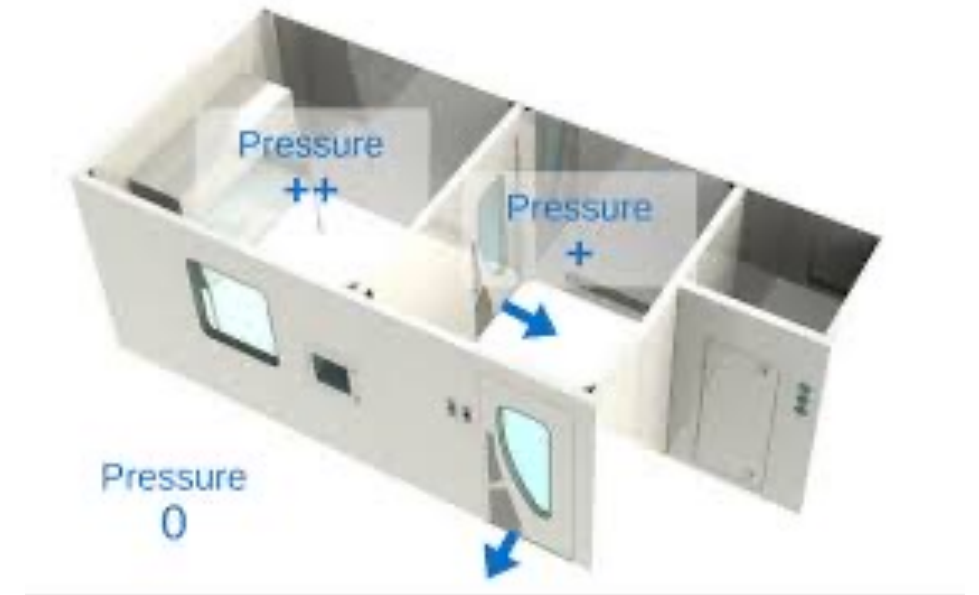
2.0 Scope

Considers:

- Dry bulb temperature and relative humidity (Standard 55—thermal comfort)
- **Not** mean radiant temperature (Standard 55—thermal comfort)
- **Not** speed of air flow; drafts (Standard 55—thermal comfort)
- Airflow rates (supply, outdoor, exhaust; **not** return, recirculated, relief or infil/exfil)
- Filtration (captures particulates)
- Cleaners (captures VOC's (read: odor), chemical, biological; **not** radiological)



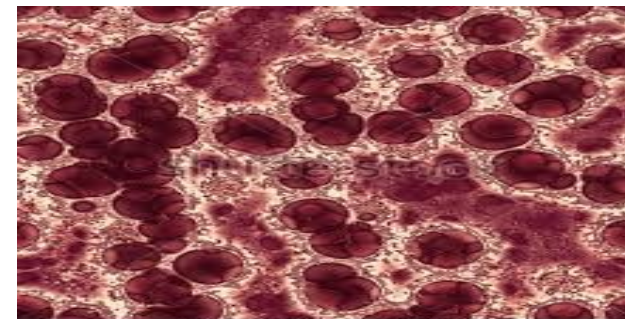
2.0 Scope



- Contamination Control = aseptic environment = state of being free from particulates and from biological matter such as bacteria, viruses and fungi... **HVAC is dominant**

is not the same as

- Infection Control = (dose x site x virulence x time)/(level of host defense)
..... **HVAC is secondary**



2.0 Scope

TRANSMISSIONS OF INFECTIOUS PATHOGENS

TRANSMISSION TYPE	HOSPITAL ACQUIRED INFECTIONS (HAI)
CONTACT – Direct or Indirect (TOUCH)	85%
DROPLET (FALL)—between 1 and 5 micron	10%
AIRBORNE (FLOAT)—smaller than 1 micron	5%

- Mechanisms by which HVAC systems can impact airborne transmission **within a room**:
 - Airflow path
 - Dilution (air changes/hour)
 - Filtration and Cleaning
 - Temperature (dry bulb), relative humidity

2.0 Scope

TRANSMISSIONS OF INFECTIOUS PATHOGENS

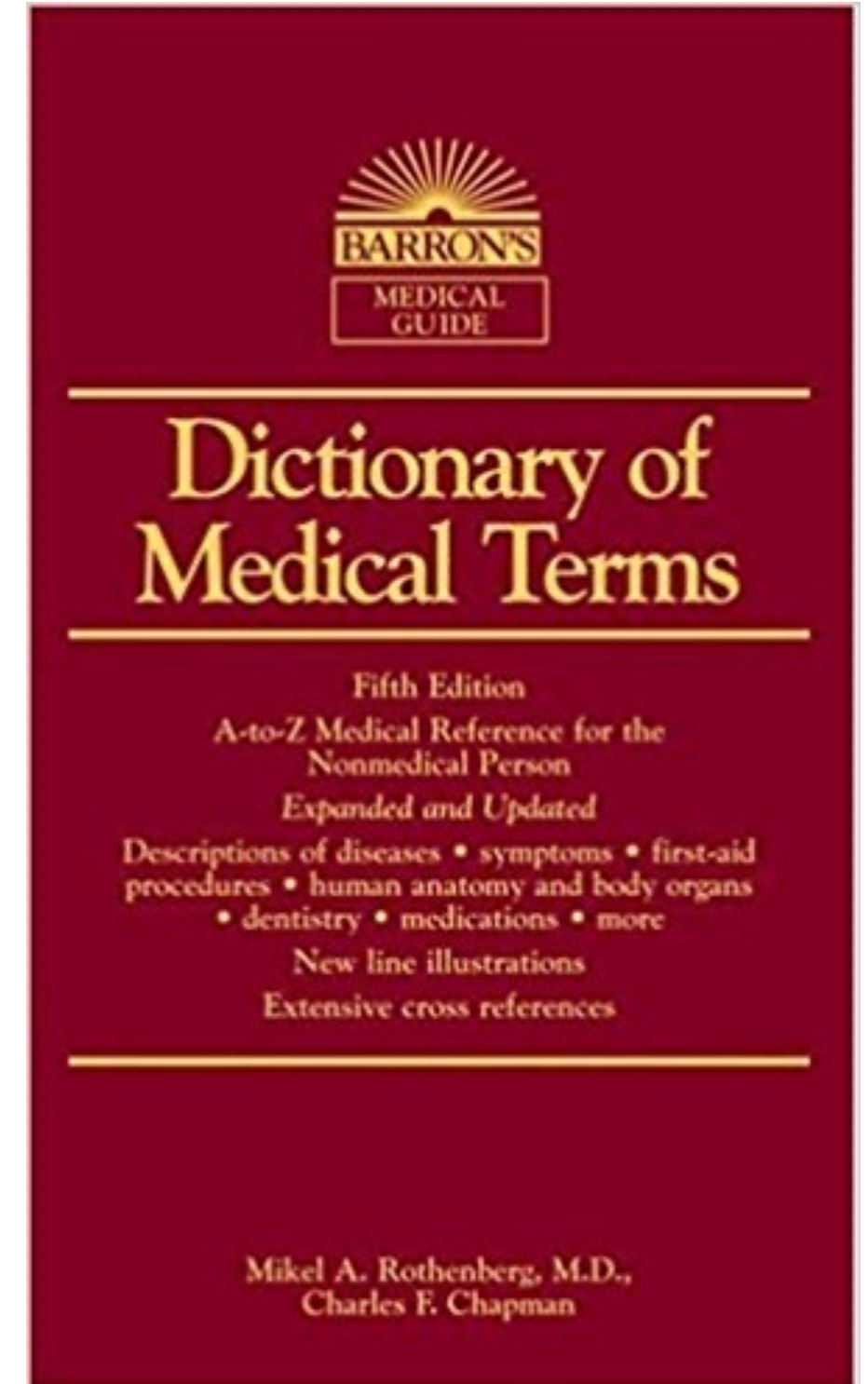
TRANSMISSION TYPE	HOSPITAL ACQUIRED INFECTIONS (HAI)
CONTACT – Direct or Indirect (TOUCH)	85%
DROPLET (FALL)—between 1 and 5 micron	10%
AIRBORNE (FLOAT)—smaller than 1 micron	5%

- Mechanisms by which HVAC systems can impact airborne transmission **outside a room**:
 - Pressurization at the room level
 - Pressurization at the suite level
 - Pressurization at the system service area level

3.0 Defintions

Definitions includes very specific medical and technical terms

- it's important to understand the vocabulary they'll need to communicate



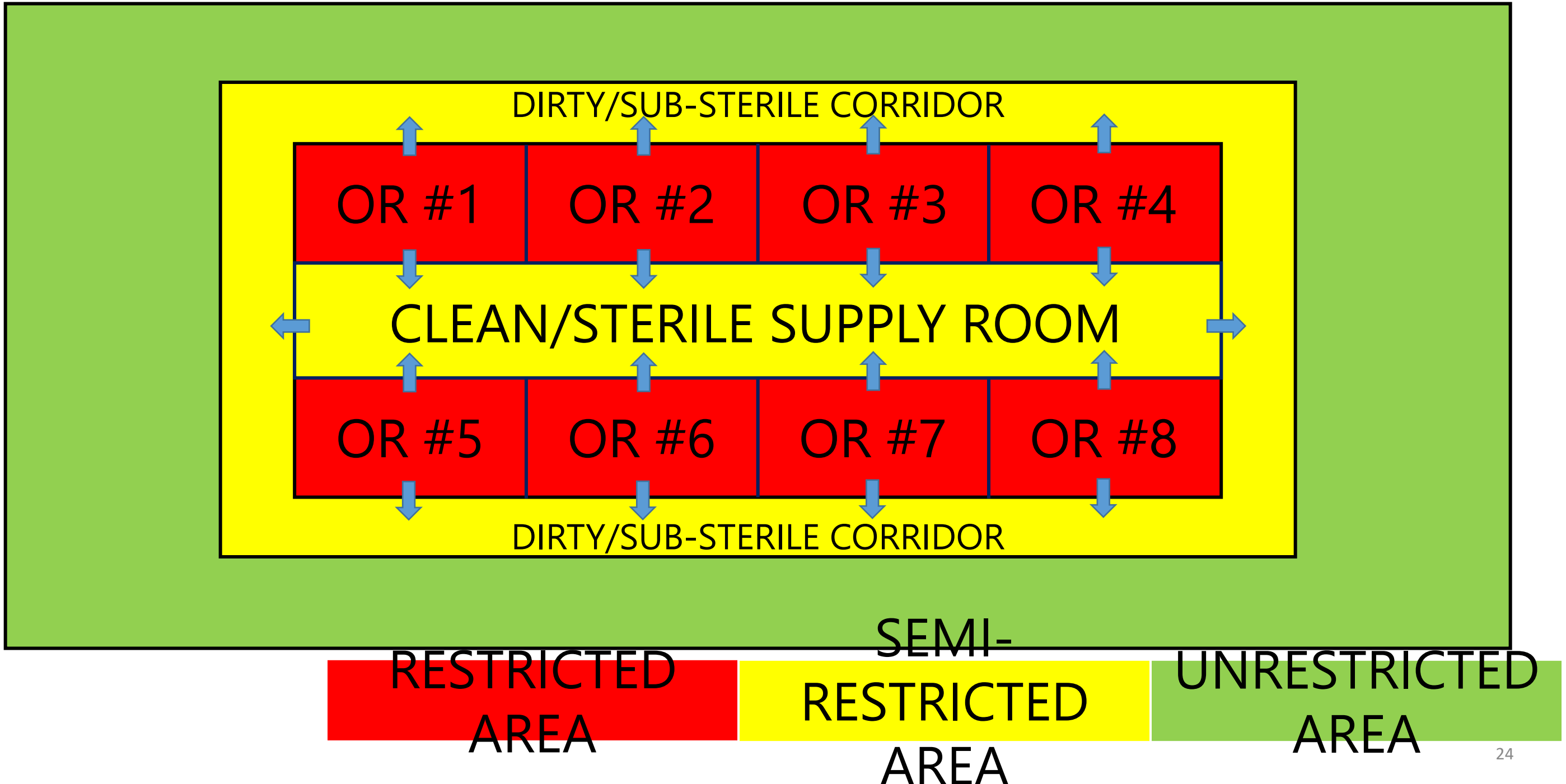
3.0 Definitions

Key Definition Additions:

- **Class 1 Imaging Room:** D only procedures w/ natural orifice entry and do not pierce or penetrate natural protective membranes (ex. MRI, US, etc.)
- **Class 2 Imaging Room:** D/T procedures such as coronary, neurological, or angiography and similar procedures (ex. cardiac cath lab, ep labe, etc.)
- **Class 3 Imaging Room:** invasive procedures and any Class 2 procedure where patient will require physiological monitoring and might require active life support (ex. stent implantation, etc.)
- **Invasive Fluoroscopy (changed to Procedural Fluoroscopy):** D/T invasive procedures that require fluoroscopic imaging (ex. implantation of cardiac devices)
- **Invasive Procedure**
- **Procedure Room**
- **CLINICAL TEAM must define their own spaces for the A/E team!!!**

3.0 Definitions—check FGI for restricted vs. semi-restricted

INVASIVE – OPERATING SUITE LAYOUT



4.0 Compliance

Compliance applies to both new buildings as well as additions and alterations to existing buildings, systems and spaces (including infrastructure upgrades)

Documentation required includes:

- Basis of Design with calcs**
- Plans
- Specs

Alternates to prescriptive criteria can always be presented to the AHJ in a timely manner for their consideration and approval

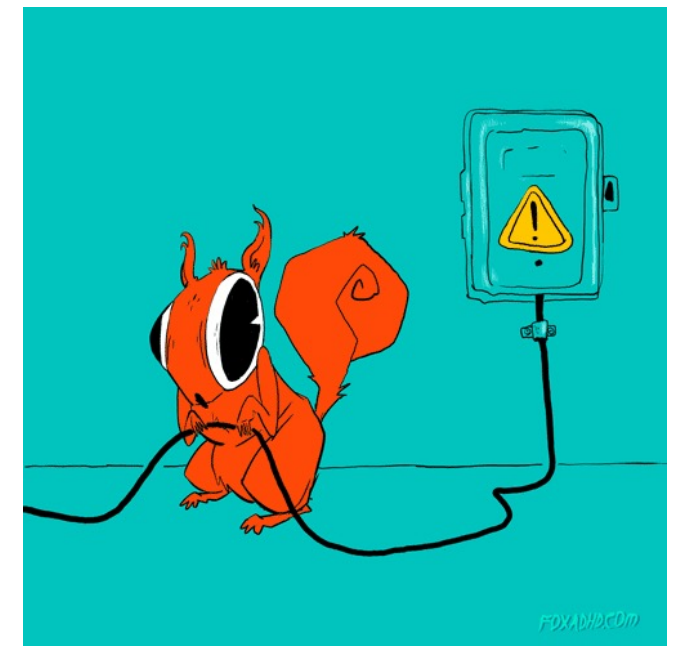


5.0 Planning (focus on planning & space allocation)

Planning requires that the Owner prepare a detailed Program; ASHRAE defines this as an **Owners Program Requirement (OPR)**:

Requirement (OPR):

- define a space-by-space program including what clinical services are to be provided and what FF&E is expected in the space
- room names per FGI (ASHRAE aligned with FGI now)
- define risk categories per NFPA 99
- define operational plan for an extended power or fuel outage



5.0 Planning (new facility)

System Sources (Steam, Heating, Cooling, AHU's)

- away from clinical spaces
- space for O&M (pm's, repairs, minor overhauls, major overhauls, replacement)
- safe access (catwalks, ladders, lifts, etc.)
- seal all floor penetrations
- note to engineers-you **must** involve facilities team



5.0 Planning (new facility)

System Distribution (Steam, Heating, Cooling, AHU's)

- Integrate all MEP systems into ceiling plenums
(integrate is proactive; coordinate is reactive)
- Integrate all MEP systems into shafts providing for access to any and all dampers and valves
- Make composite MEP drawings in 3-D



5.0 Planning (existing facility)

Infection Control and Risk Assessment (ICRA)—now **PCRA**!!

- Goal is to minimize disruption to the patients and staff
- Goal is to maximize contamination control in order to maximize infection control



5.0 Planning (new or existing facility)

Planning for HVAC System Operation during Construction

- *Owner and design team shall determine if, and under what conditions, the permanent HVAC systems can be used for providing temporary heating, cooling, and/or dehumidifying during construction. Refer to Section 10.1.4.3(b).*



6.0 Systems and Equipment

- 6.1 Utilities
- 6.2 Air Handling Unit (AHU) Design
- 6.3 Outdoor Air Intakes and Exhaust Air Outlets
- 6.4 Filtration (particulates only)
- 6.5 Heating and Cooling Systems
- 6.6 Humidifiers
- 6.7 Air Distribution Systems
- 6.8 Energy Recovery Systems
- 6.9 Insulation and Duct Lining



6.0 Systems and Equipment-6.1 Utilities

Ventilation Systems That Must be Connected to the Appropriate Branch of the Essential Power System (EPS):

- All Rooms
- PE Rooms
- OR's including C- Section and Cysto
- Keep in mind that if space heating is accomplished by moving air, all those AHU's must also be connected to the EPS ('cause hospitals tend to use single path all-air systems)



6.0 Systems and Equipment – 6.1 Utilities

- Reserve Capacity (n+1) Required for DHW, Sterilization, Dietary, Humidification and Seasonal Space Heating for Operating, Delivery, Birthing, Labor, Recovery, Intensive Care, Nursery, and Inpatient Rooms
- Dual Fuel Required (**even for HHW condensing boilers**)
- Reserve Capacity (n+1) is not required if the ASHRAE 99% dry bulb is greater than or equal to 25 F; however; Reserve Capacity (n+1) is still required for DHW, Sterilization, Humidification and Dietary



6.0 Systems and Equipment – 6.1 Utilities

- Reserve Capacity ($n + 1$) Required for Enough of the Space Cooling Load to Meet the Owners' Program if the Seasonal Space Cooling Load and Process Cooling Load is Greater Than 400 Tons (serious discussion needed between Owner and Engineer)
- Don't forget about connection to the EES!
- Don't forget about those heat recovery chillers, too –they do heating!!!



6.0 Systems & Equipment – 6.3 OAI & EAO

- Major effort to align this section with ASHRAE Standard 62.1—Ventilation for Acceptable Indoor Air Quality



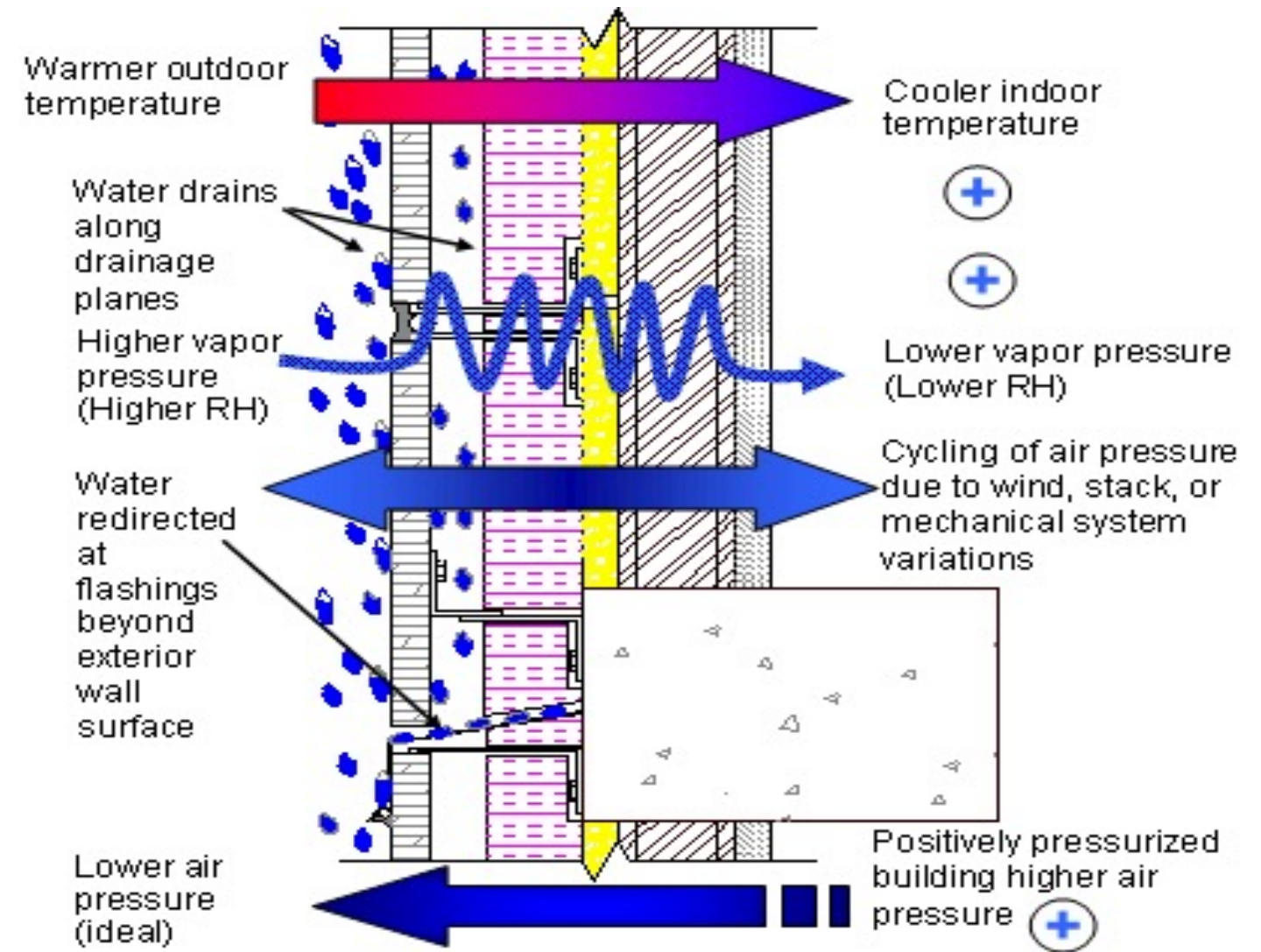
6.0 Systems & Equipment – 6.6 Humidifiers

- **Adiabatic high pressure water atomizing humidifiers are now allowed (decarbonization)**
- Must use RO water
- Must use a UV-C sterilization light
- Must use a sub-micron filter
- Check with local AHJ's before using this type of humidifier
- Compressed air nozzle, centrifugal atomizer and ultrasonic humidifiers are not acceptable
- Water temperature per legionella risk management plan
- Adjust heating coil capacity up; lengthen AHU



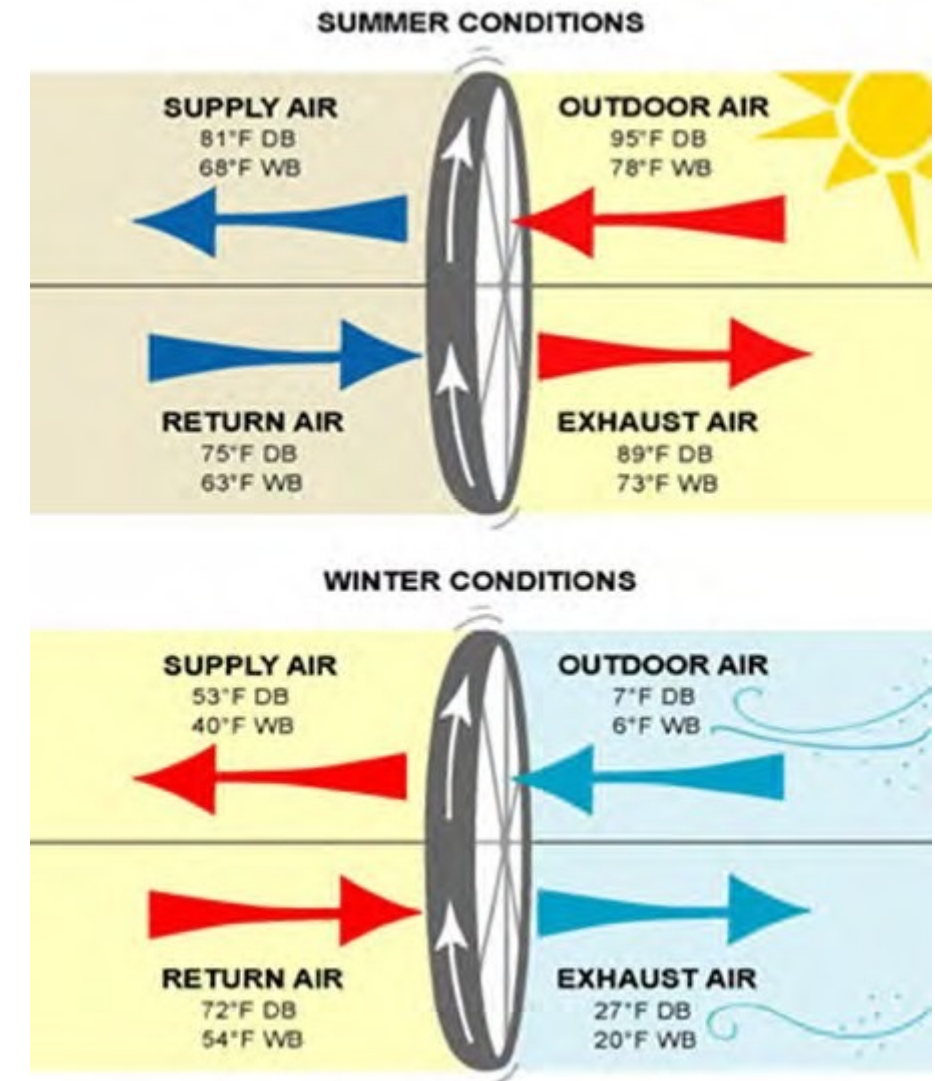
6.0 Systems & Equipment – 6.7 Air Distribution Systems

- **New section on air balancing**
- Considers pre-testing defined by design engineer and carried out by a qualified contractor
- Considers post-construction defined by design engineer and carried out by a qualified contractor
- Considers building pressurization---a complicated analysis that needs to be done by a design engineer



6.0 Systems & Equipment – 6.8 Energy Recovery Systems

- Air-to-air energy recovery wheels must be located upstream of filter bank #1 and #2
- Air-to-air energy recovery wheels can be used with exhaust air with no more than 5% leakage (keep in mind that air-to-air energy recovery cannot be used with All room or other exhaust systems moving toxic/noxious Class 4 air)



7.0 Space Ventilation

- 7.1 General
- 7.2 Room Specific Requirements
- 7.3 Critical Care Units
- 7.4 Surgery Rooms
- 7.5 Support Spaces
- 7.6 Behavioral and Mental Health



7.0 Space Ventilation – 7.1 General

- Table 7.1 defines several design parameters—added two (2) columns
- --unoccupied turndown
- -final filter
- Air movement should always be from clean to less clean
- VAV systems cannot compromise pressure relationships or minimum air change requirements
- Air changes can be reduced when a space becomes unoccupied provided that required air pressure relationship is maintained, if allowed
- Higher air change rates may be required to maintain room temperatures
- Recirculating room HVAC units can be used where allowed per Table 7.1 such as Passive Chilled Beam, Active Chilled Beam or Fan Coil Units but must be provided with a MERV 6 filter upstream of any cooling coil (keeps the cooling clean)

7.0 Space Ventilation – 7.3 Room Specific Requirements

Burn unit patient rooms (WICU) require booster humidifiers in order to achieve a relative humidity level of 40% ; this assumes that the central AHU provides a 30% level of relative humidity across its' entire service area

Neonatal intensive care rooms (NICU) may need to be provided with booster humidifiers in order to achieve a relative humidity level of 40%
[suggestion]

Both become trickier without any steam.....



Space Ventilation – 7.4 Room Specific Requirements

At least 0.01" w.g. positive pressure at all times; [design .03" ---alarm .01"]
 Primary supply diffuser array must extend 12" beyond the footprint of the surgical table; additional supply diffusers may be located elsewhere in the OR

At least 70% of the area associated with the 12" extension must be diffusers (implies that 100% of the area associated with the surgical table must be diffusers)



TABLE 6.7.2 Supply Air Outlets

Space Designation (According to Function)	Supply Air Outlet Classification ^a
Operating rooms, procedure rooms (all class A, B, and C surgeries ^b)	Primary supply diffusers Group E, nonaspirating additional supply diffusers, Group E
Protective environment (PE) rooms	Group E, nonaspirating
Wound intensive-care units (burn units)	Group E, nonaspirating
Trauma rooms (crisis or shock)	Group E, nonaspirating
All rooms	Group A or Group E
Single-bed patient rooms ^c	Group A, Group D, or Group E
All other patient-care spaces	Group A or Group E
All other spaces	No requirement

Notes:
 a. Refer to the 2009 ASHRAE Handbook—Fundamentals, Chapter 20 (see ASHRAE [2009] in Informative Appendix B), for definitions related to outlet classification and performance.
 b. Surgeons may require alternate air distribution systems for some specialized surgeries. Such systems shall be considered acceptable if they meet or exceed the requirements of this standard.
 c. Air distribution systems using Group D diffusers shall meet the following requirements:
 1. The system shall be designed according to "Design Guidelines" in Chapter 7 of ASHRAE System Performance Evaluation and Design Guidelines for Displacement Ventilation.¹¹
 2. The supply diffuser shall be located where it cannot be permanently blocked (e.g., opposite the foot of the bed.)
 3. The room return/exhaust grille shall be located in the ceiling, approximately above the head of the patient bed.
 4. The transfer grille to the toilet room shall be located above the occupied zone.

Space Ventilation – 7.4 Room Specific Requirements

Primary supply diffusers at a speed of 25 to 35 ft/min w/ unidirectional flow (term “laminar flow” is N/A; parallel streamlines likes straws in a box)

At least two (2) low sidewall return grilles (bottom at 8" AFF) on opposite sides of room; wall-mounted return air grilles located high as well as ceiling-mounted returns outside the sterile field are preferred (current research supports these flow patterns)



8. Space Ventilation – Outpatient Spaces

- Does NOT provide for comfort, odors, airborne transmission
- NEW: Table 8-1 Design Parameters – **Specialized** Outpatient Spaces
- NEW: Table 8-1: Column: Minimum filter Efficiencies
- NEW: Table 8-2: Design Parameters – **General** Outpatient Spaces
- Night Setback / unoccupied:
 - 55 degF – 85 DegF / 65% RH - max

8.1 – Specialized Outpatient Facility

- Specialized Defined as:
 - Surgical
 - Endoscopy
 - Infusion
 - Renal Dialysis
 - Freestanding emergency departments
 - Class 2 and Class 3 imaging
- Ventilation as listed.
 - If not listed, by function or ASHRAE 62.1
- Minimum Filter: MERV **8** (was 6)

Table 8-1 **NEW**

- READ the NOTES!
- b. - Pharm. prep: Minimum efficiency filters per USP 795, USP 797, USP 800
- g. – Diagnostic Imaging: ICRA governs or else ASHRAE 62.1
- s. – Sterile equipment: MERV 14 – minimum
- t., u. – Where anesthetic gases used: Air changes are 6
- ff. – Facility to tell designer the class of imaging room

8.2 **General** Outpatient Facility Requirements

- ASHRAE standards are often basis of state and local building codes.
 - BUT: Regional conditions and interests.
 - THEREFORE: **Follow local codes as possible.**
- For positive or negative pressure areas, air changes can be reduced when unoccupied as long as **pressure relationship is maintained.**
- A lot **new**, including Table 8-2
- READ the NOTES: many new.
 - Notes tell when to refer to Table 8-1

8. - continued

- 8.5.3 - Gas Storage Rooms: Ventilation complies with NFPA 99
- 8.6 - Behavioral Health: HVAC systems and controls secured as in risk assessment
- 8.7 - Nuclear Medicine: refer to Table 8-2
 - Deal with Treatment areas and hot labs

9. Space Ventilation – Resident Health, Care and Support Spaces - **NEW**

- Does NOT protect from discomfort, odors, airborne
- **New** Table 9-1
 - Read the NOTES
- **New** Columns:
 - Unoccupied Turndown
 - Minimum Filter Efficiencies
- If area not covered, refer to ASHRAE 62.1 or 62.2
- 9.4.2 – Food prep: Make up air

10. (REVISED) ~~Planning~~, Construction and System Start-Up

- 10.1 – Protect materials in transit and on site
- 10.1.4 - Use ICRA as required or section 5.5



10.1.4.3 – HVAC During Construction - **NEW**

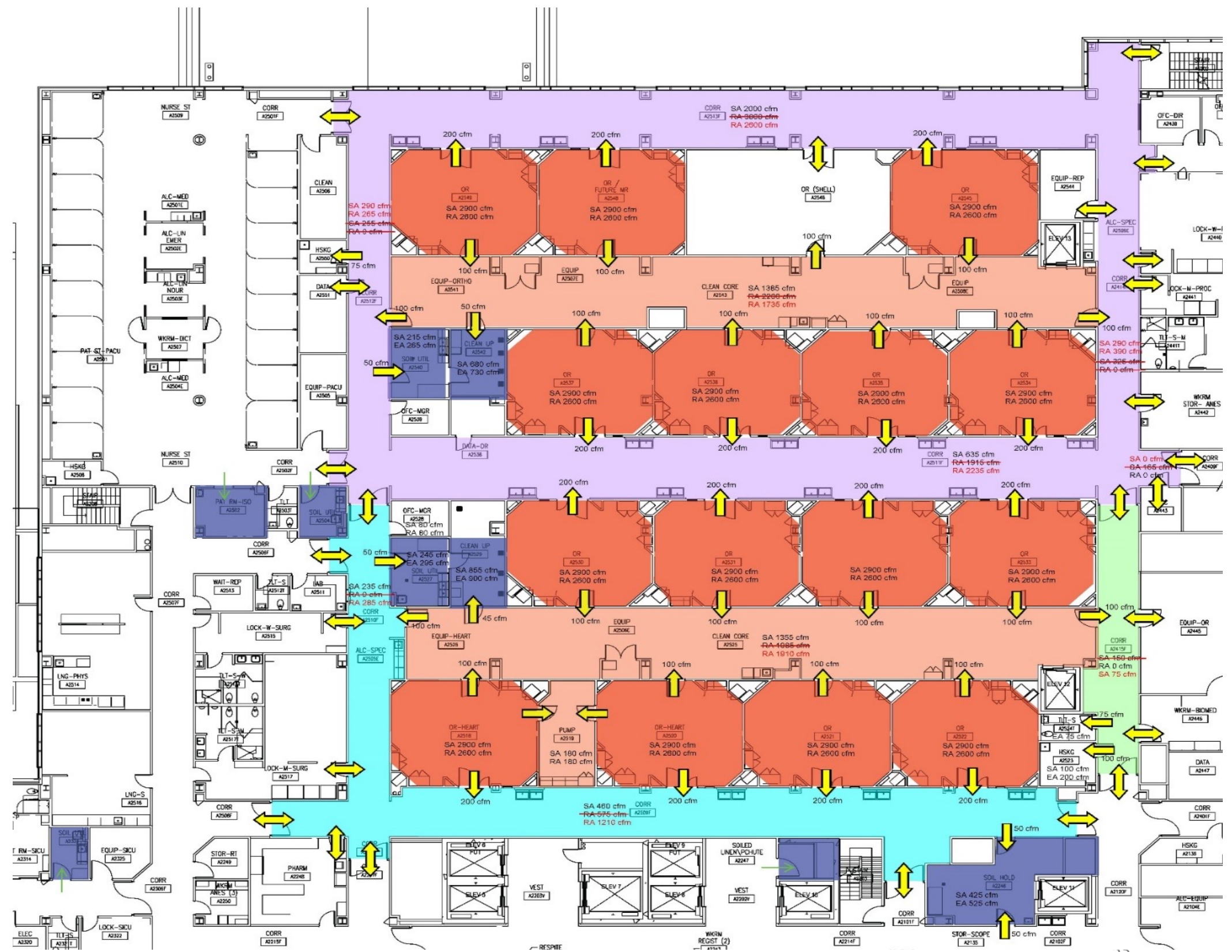
- Prevent microbial growth
- If permanent HVAC equipment is used during construction:
 - 1. Supply 100% outdoor air
 - 2. Provide pressure relief
 - 3. Provide final level of filtration in air-handling units (AHUs).
 - 4. Cover supply duct openings when air-handler(s) are OFF.
 - 5. Provide prefilters over outdoor air
 - 6. Clean air-handling components prior to occupancy.
 - 7. Operate AHU(s) only if safety devices and sequences are in place and operational.
- After testing and balancing is complete, isolate system

10.2 – System Start Up - **NEW**

- Test and balance per national standards
- Testing of Drain Pans:
 - Issue: water stagnation & microbial growth: verify function
- Follow manufacturer's start-up recommendations and requirements.

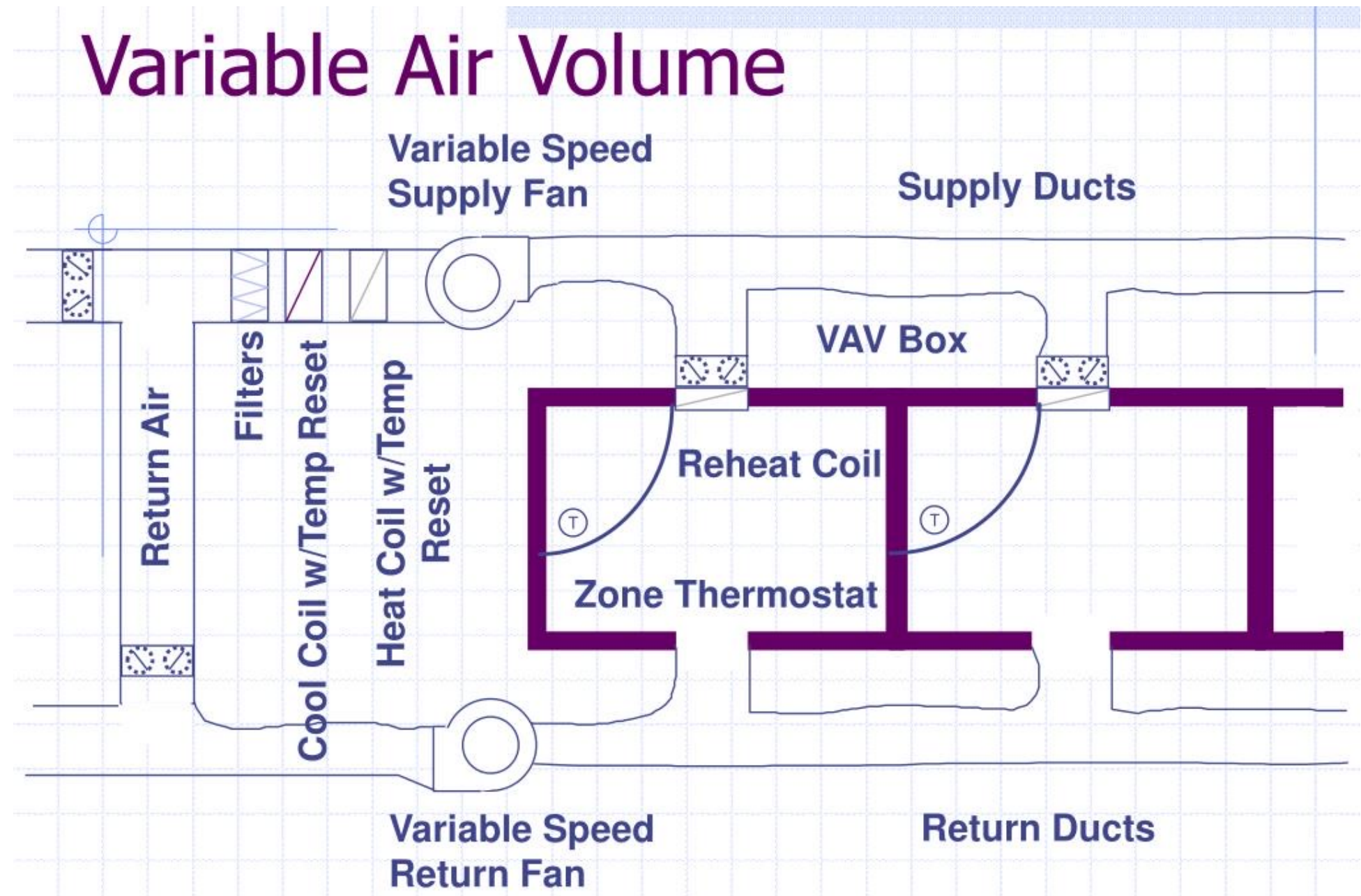
Case Study #7

- **Problem:**
- Owner detected dP going negative in each OR from time to time
- Airflow by testing specialist confirmed a few negative OR's



Case Study #7

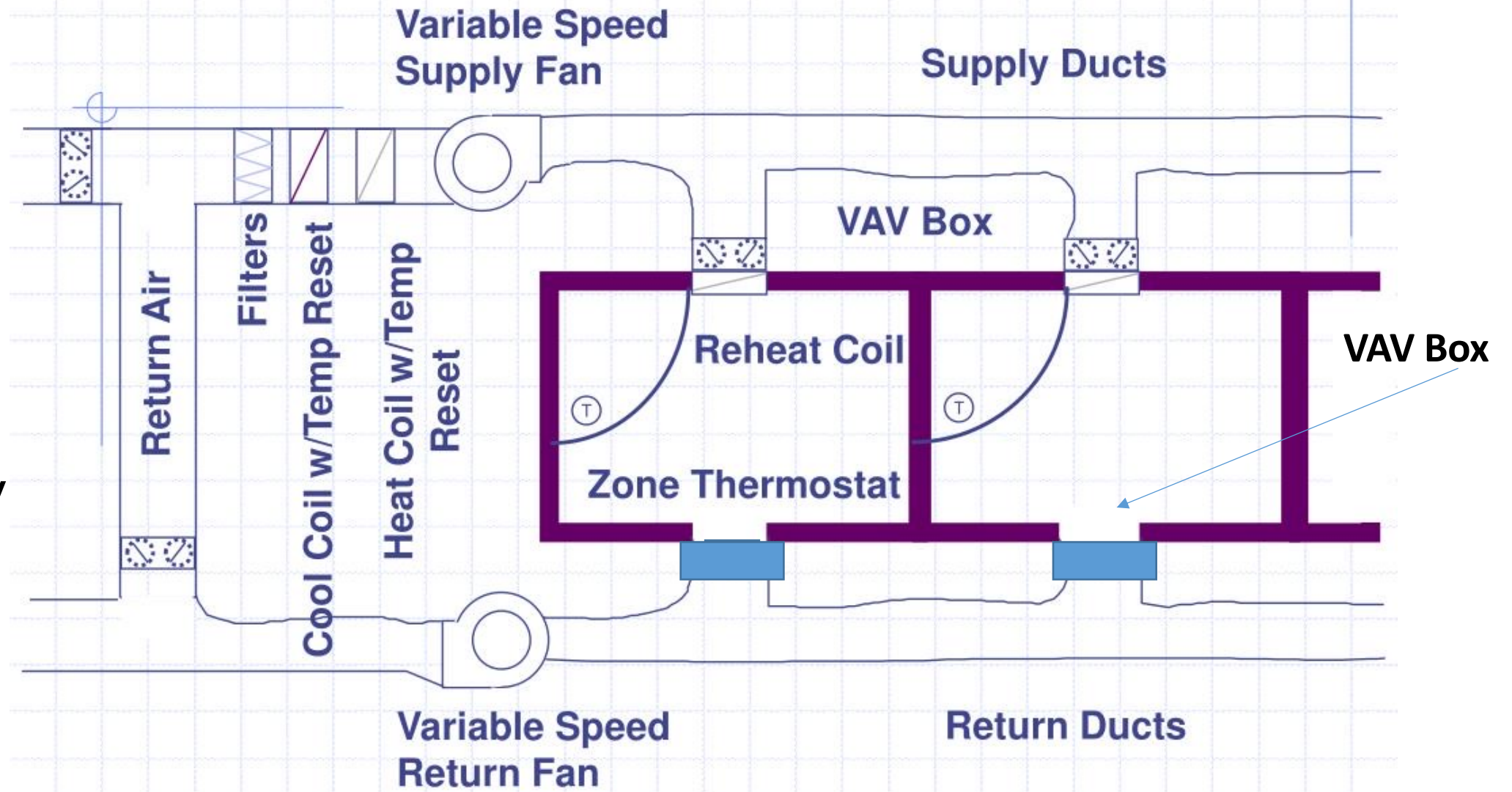
- **Discovery:**
- Design Engineer consulted to problem solve
- Uncovered two (2) issues:
 - 1. no active control of return air
 - 2. improper diffuser locations in corridor w.r.t. OR door



Case Study #7

- **Solution:**
- F/I terminal units on return air system; tricky design and construction
- Reconfigure supply and return air diffusers in semi-restricted corridor outside the OR's

Variable Air Volume



HVAC-17

Case Study #7

- **Results:**
- Continuous pressure independent control
- Occupied mode – OK
- Unoccupied mode-OK (saves 3000 cfm for \$3000/yr)
- BAS trends proved compliance
- Airflow testing proved compliance

**Interested?
GET INVOLVED!!!**

Here's How.....

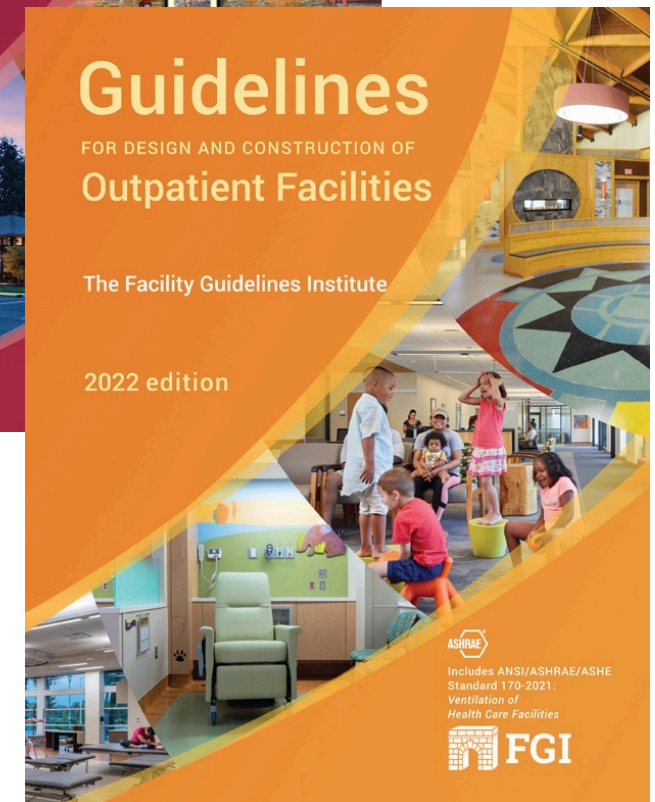
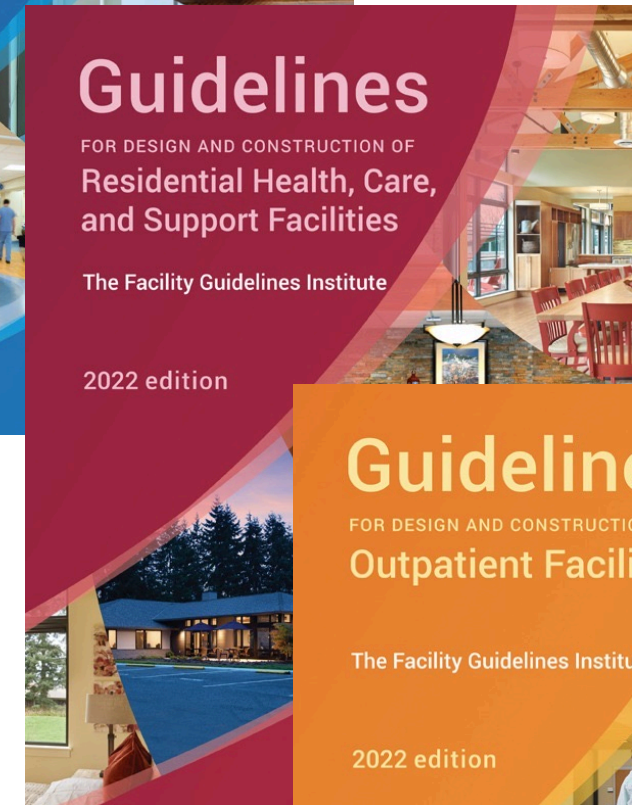
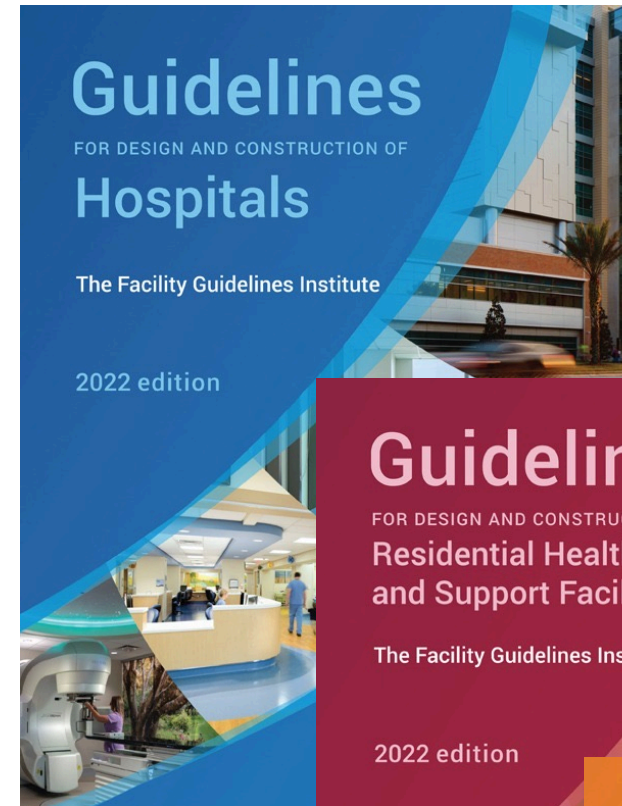




FGI Guidelines - 2026

ONE more open review periods:

Comment Period
July 1 through September 30, 2024



170 – Addenda - Errata – Interpretations: Download for **FREE** from ASHRAE



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Standards and Guidelines Under Continuous Maintenance

NEW! Access the online comment database to submit continuous maintenance comments on standards and guidelines under continuous maintenance. A complete list of standards and guidelines under continuous maintenance is available in the database.

Under continuous maintenance procedures anyone may propose changes at any time to a standard or guideline under continuous maintenance. Proposals are submitted to the Standing Standard Project Committee (SSPC) or Standing Guideline Project Committee (SGPC), according to a definite schedule, shown in Clause 2. The project committees may also propose changes

30-Day Public Review Period from March 24, 2023 to April 23, 2023

COMMENT [BSR/ASHRAE Addendum e to ANSI/ASHRAE Standard 62.2-2022, Ventilation and Acceptable Indoor Air Quality in Residential Buildings \(First Public Review Draft\)](#)
Full Public Review
Ventilation and Acceptable Indoor Air Quality in Residential Buildings

COMMENT [BSR/ASHRAE/ICC/IES/USGBC Addendum au to BSR/ASHRAE/ICC/IES/USGBC Standard 189.1-202x](#)
Full Public Review
Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

- PROPOSE** [ASHRAE Standard 160](#)
Criteria for Moisture-Control Design Analysis in Buildings
- PROPOSE** [ASHRAE Standard 161](#)
Air Quality Within Commercial Aircraft
- PROPOSE** [ASHRAE Standard 169](#)
Climatic Data for Building Design Standards
- PROPOSE** [ASHRAE/ASHE Standard 170](#)
Ventilation of Health Care Facilities
- PROPOSE** [ASHRAE Standard 185.1](#)

Screenshot [ACCESS DATABASE NOW](#)

Appendix A – Operations and Maintenance Procedures:

Guideline 43 – in comment period!

PURPOSE

- Operation of HVAC systems in health care facilities

SCOPE:

- Operation of health care facility HVAC systems and equipment, maintenance, and energy conservation.
- Operation and preventative maintenance, and risks, including infection prevention
- Health care spaces to monitor, what to monitor and the means of monitoring and recording.
 - ranges in monitored spaces
 - time-dependent protocols when out of range.
- Emergency operations: continuity of service and resiliency planning.
- Does not cover new design

Summary: ASHRAE 170 Update

- 170 Background
- What has changed / improved / deleted
- Guideline 43
- How to get involved

Questions? Comments?



170-2021 Update - Presenters

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