

SMITHGROUP & MIAPPA

New Michigan MEP Code Updates 2024-2025



SMITHGROUP

AGENDA

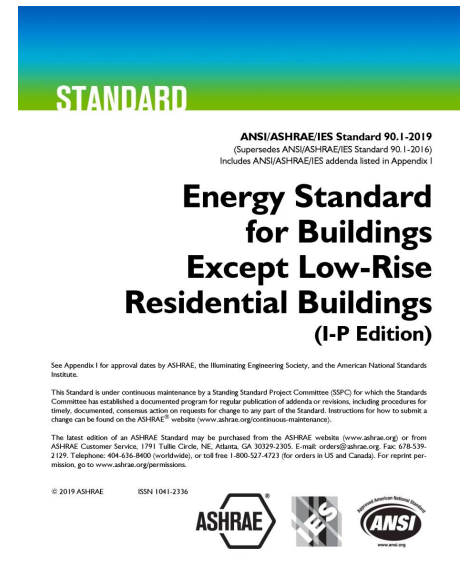
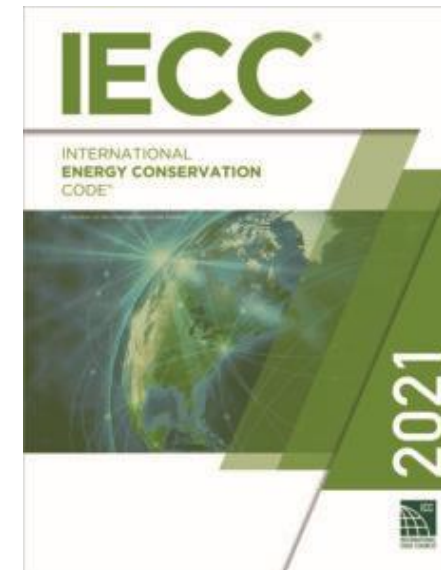
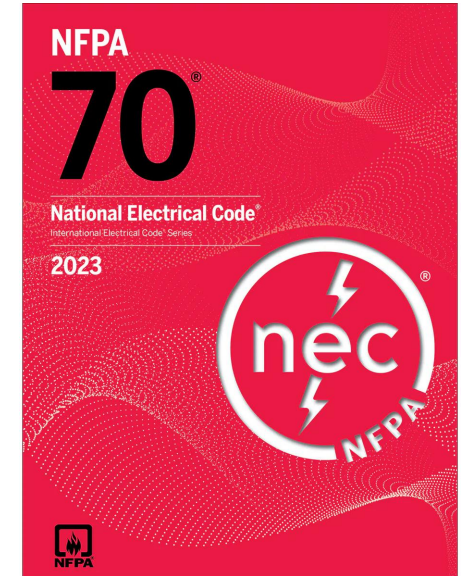
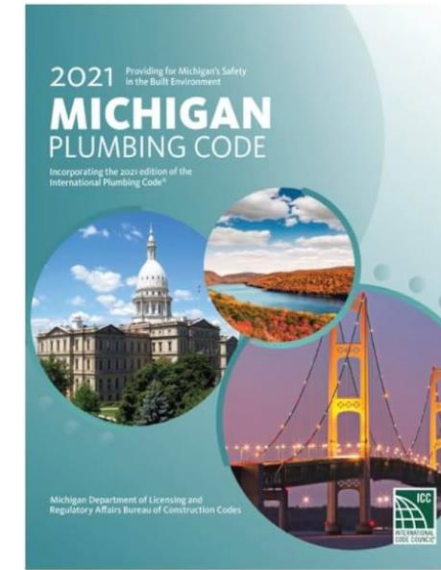
MIAPPA 2025

Major Changes From...

- 2021 Michigan Mechanical Code
- 2021 Michigan Plumbing Code
- 2023 Michigan Electrical Code
 - 2023 National Electrical Code

Will Touch On...

- ASHRAE 15 (2022)
- 2021 Michigan Commercial Energy Code
 - 2021 IECC
 - ASHRAE 90.1-2019



WHO'S HERE TODAY

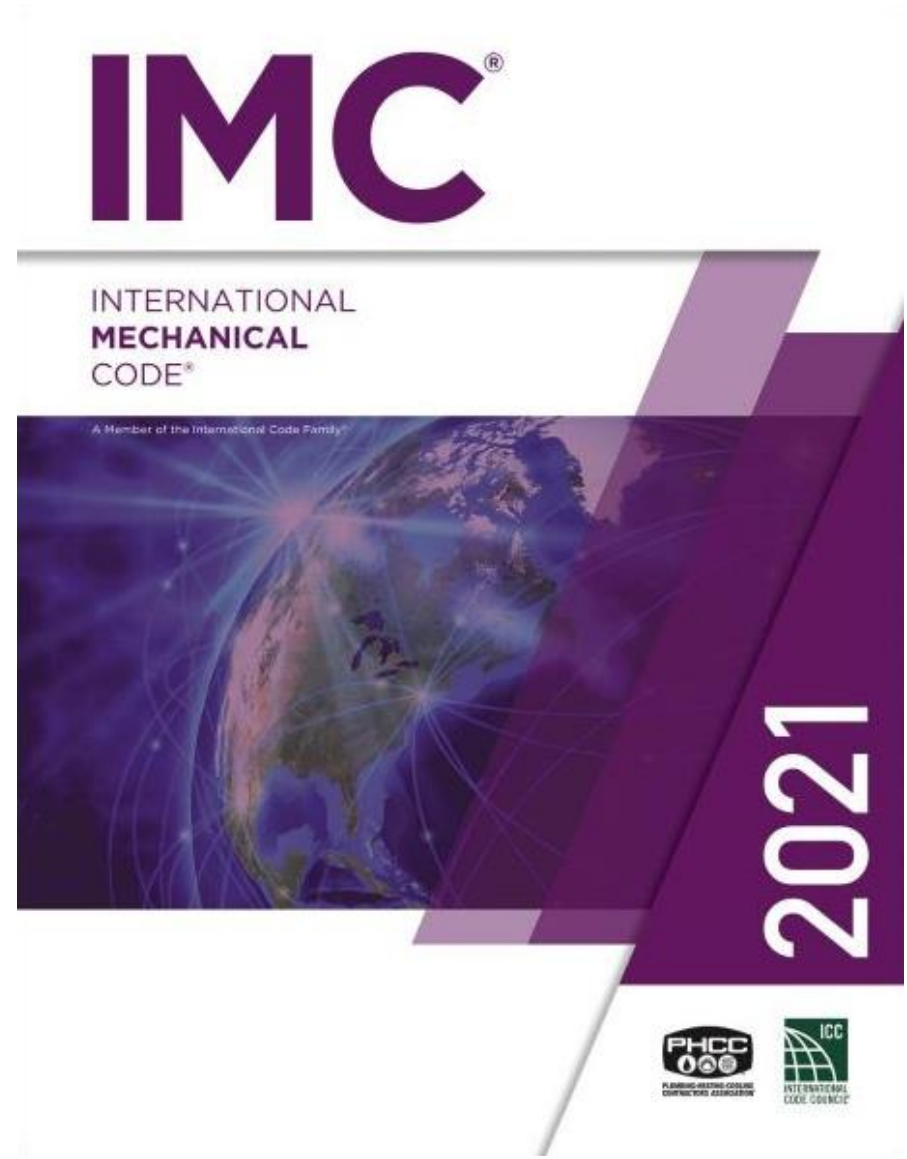
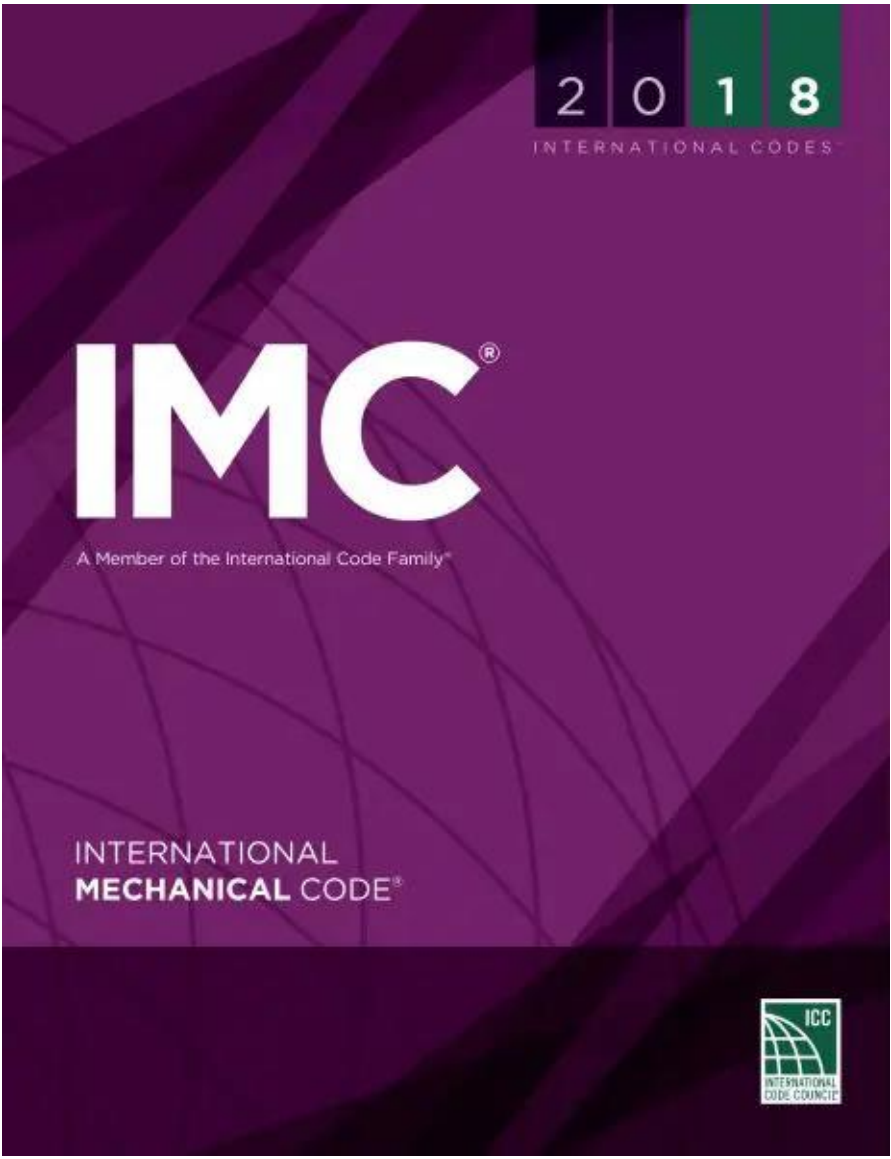
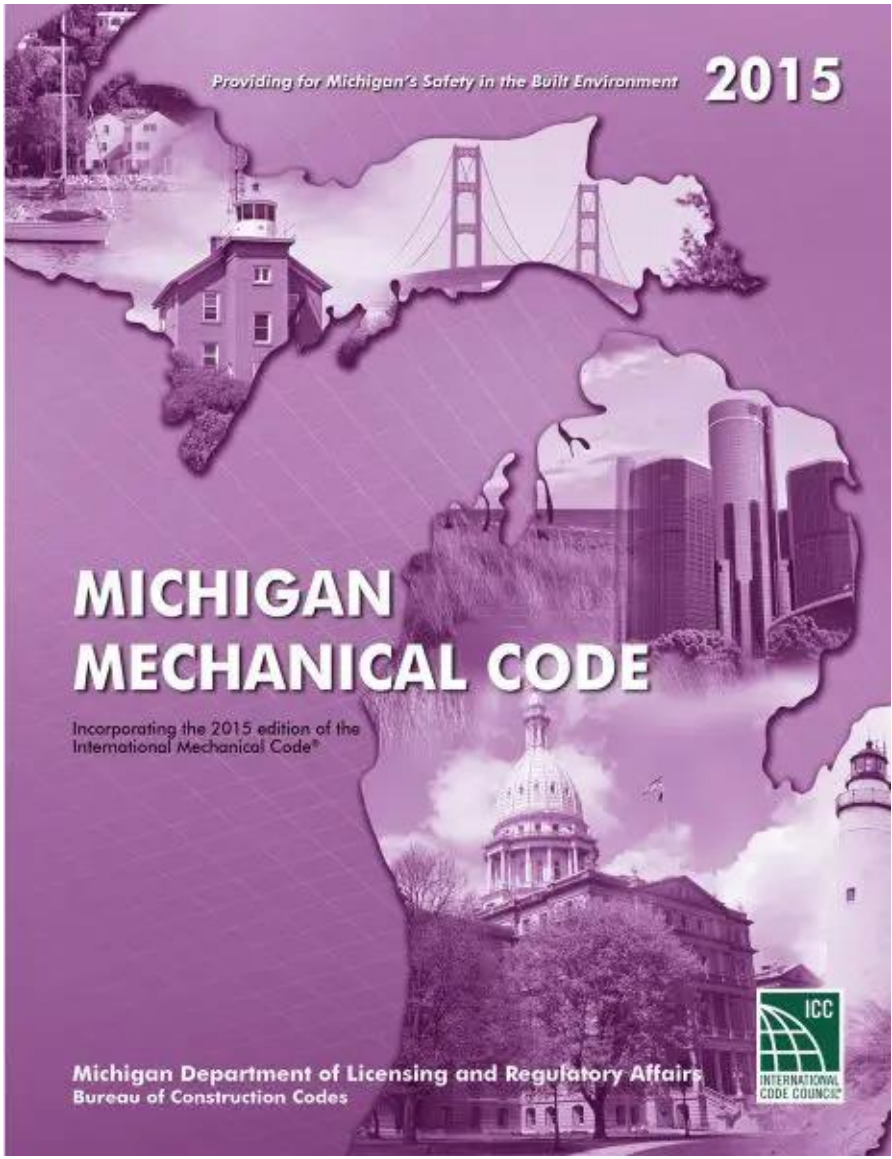


KURT CUNNINGHAM
PE
Mechanical Engineer



DAN YENSCH
PE, LEED GREEN ASSOCIATE
Electrical Engineer

MECHANICAL UPDATES



MECHANICAL UPDATES

MMC 2015 TO IMC 2021 WITH STATE AMENDMENTS

- Chapter 1: Scope and Administration
- Chapter 2: Definitions
- **Chapter 3: General Regulations**
 - **301 General (MI Amendment)**
 - 303 Equipment and Appliance Location (2015-2018) – Minor Changes
 - **307 Condensate Disposal (2018-2021)**
 - **309 Temperature Control (MI Amendment)**
- **Chapter 4: Ventilation**
 - **403 Mechanical Ventilation (2018-2021)**
 - 404 Enclosed Parking Garages (2015-2018) – Minor Changes
- **Chapter 5: Exhaust Systems**
 - **502 Required Systems (2015-2018-2021)** – Also Battery Storage
 - **504 Clothes Dryer Exhaust (2015-2018-2021)**
 - 505 Domestic Kitchen Exhaust Equipment (2015-2018) – Domestic Occupancies
 - **506 Commercial Kitchen Hood Ventilation (2015-2018)**
 - 507 Commercial Kitchen Hoods (2015-2018) – Smokers
 - **510 Fire Suppression Systems (2015-2018)** – Also Dust Collection
 - **514 Energy Recovery Ventilation Systems (2018-2021)**
- **Chapter 6: Duct Systems**
 - 601 General (2015-2018) – Swimming Pools
 - 602 Plenums (2015-2018) – Minor Changes
 - 603 Duct Construction and Installation (2015-2018) – Underground, Phenolic, Joints
 - 604 Insulation (2015-2018) – Vapor Retarders
 - **607 Duct and Transfer Openings (2015-2018-2021)**
 - **608 Balancing (2018-2021)**
- Chapter 7: Combustion Air – Minor Changes
- Chapter 8: Chimneys and Vents – Minor Changes
- **Chapter 9: Specific Appliances, Fireplaces, and Solid Fuel-Burning Equipment**
 - 929 Solid Fuel Hydronic Heaters (Changed to Decorative Appliances)
 - **930 Large Diameter Ceiling Fans (2015-2018-2021)**
- **Chapter 10: Boilers, Water Heaters and Pressure Vessels**
 - **1001 General (MI Amendments)**
 - 1006 Safety and Pressure Relief Valves and Controls (2015-2018) – Minor Changes
 - 1009 Hot Water Boiler Expansion Tank (2015-2018) – Minor Changes
- **Chapter 11: Refrigeration**
 - **1101 General (2018-2021)**
 - 1104 System Application Requirements (2015-2018) – Industrial Occupancies
 - **1105 Machinery Room, General Requirements (2015-2018-2021)**
 - **1106 Machinery Room, Special Requirements (2015-2018)**
 - **1107 Piping Material (2015-2018-2021)**
 - **1108 Joints and Connections (2018-2021)**
 - **1109 Refrigerant Pipe Installation (2018-2021)**
 - **1110 Refrigeration Piping System Test (2018-2021)**
- Chapter 12: Hydronic Piping – Minor Changes
- Chapter 13: Fuel Oil Piping and Storage – Minor Changes
- **Chapter 14: Solar Thermal Systems**
 - **1401 General (2015-2018)**
 - **1402 Installation (2015-2018)**
 - **1403 Heat Transfer Fluids (2015-2018)**
 - **1404 Materials (2015-2018)**
- Chapter 15: Referenced Standards
- Chapter 16: Fire Protection – NFPA Reference Update
- Chapter 17: Process Piping – ASME B31.3 Reference Update

MECHANICAL UPDATES

TOPIC: CH 3 - GENERAL REGULATIONS

MI Amendments to Ch 3: 301.10.1

R 408.30923a Equipment installation.

Rule 923a. Section 301.10.1 is added to the code and section 309.1 of the code is amended to read as follows:

301.10.1. Electrical disconnect. The mechanical contractor shall ensure that all equipment is equipped with **an externally accessible electrical disconnect switch on, or within 6 feet of,** the equipment. The disconnect shall be permanently identified.



6 ft Max!



MECHANICAL UPDATES

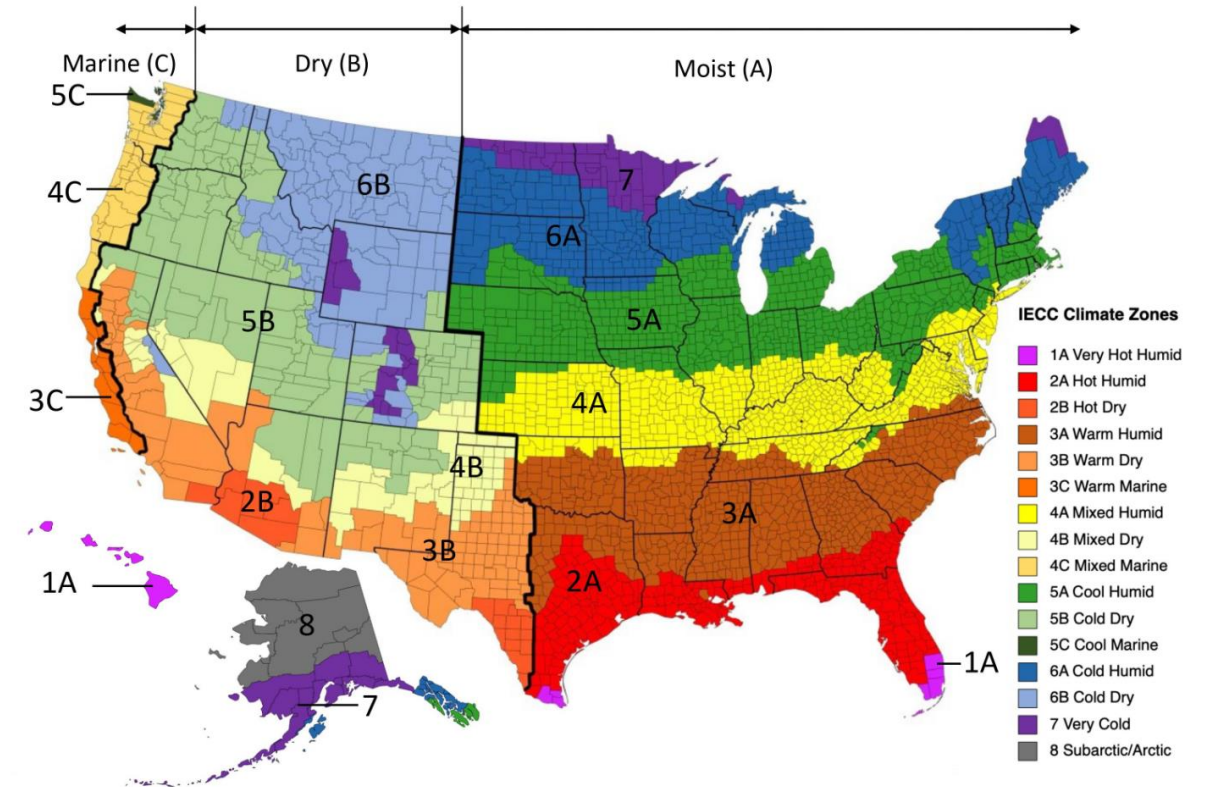
TOPIC: CH 3 - GENERAL REGULATIONS

MI Amendments to Ch 3: 309.1

309.1. Occupiable space heating systems. Interior spaces intended for human occupancy shall be provided with heating facilities capable of maintaining a minimum interior room temperature of 68 degrees Fahrenheit, 20 degrees Celsius, at a point 3 feet, 914 millimeters, above the floor and 2 feet, 609.6 millimeters, from exterior walls at the required design temperature. The installation of portable space heaters shall not be used to comply with this section.

Exception:

1. Interior spaces where the primary purpose is not associated with human comfort.
2. Interior, seasonal spaces that are unoccupied during cold weather months, including restrooms, shower buildings, day use restrooms, concession stands, press boxes, ticket booths and locker rooms.
3. Group F, H, S or U occupancies.



“Cold weather months”

means November 1 through April 1 in Michigan Uniform Energy Code climate zone 5A and from October 15 through May 1 in Michigan Uniform Energy Code climate zones 6A and 7.

MECHANICAL UPDATES

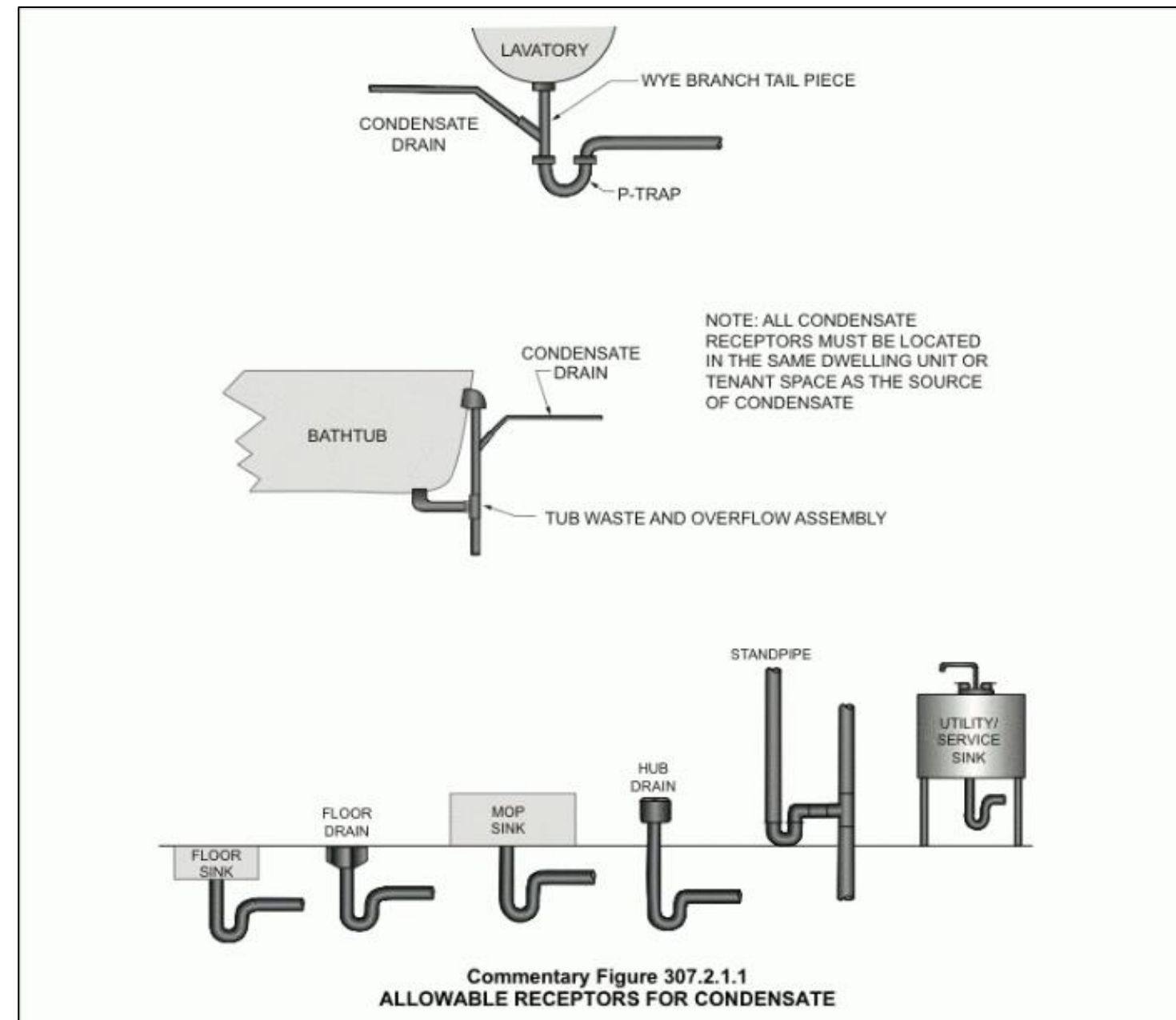
TOPIC: CH 3 - GENERAL REGULATIONS

Code Enhancements to Ch 3: 307.2 Condensate Disposal

307.2.1.1 Condensate discharge. Condensate drains shall not directly connect to any plumbing drain, waste or vent pipe. Condensate drains shall not discharge into a plumbing fixture other than a **floor sink, floor drain, trench drain, mop sink, hub drain, standpipe, utility sink or laundry sink. Condensate drain connections to a lavatory wye branch tailpiece or to a bathtub overflow pipe shall not be considered as discharging to a plumbing fixture.** Except where discharging to grade outdoors, the point of discharge of condensate drains shall be located within the same occupancy, tenant space or dwelling unit as the source of the condensate.

Commentary: This section states prohibitions on what are bad practices and also states allowances for what are considered to be acceptable practices for condensate discharge. The code was silent on these practices until 2021. This text expressly prohibits the connection of condensate drains directly to DWV piping and prohibits condensate from discharging into plumbing fixtures other than those listed. The intent is to prevent insanitary conditions and potential health hazards.

REQUIREMENTS DUPLICATED IN IPC sections 314.1.1, 314.2.1.1, 314.2.3.3



307.2.3.3 Identification. The termination of concealed condensate piping shall be marked to indicate whether the piping is connected to the primary or secondary drain.

MECHANICAL UPDATES

TOPIC: CH 4 - VENTILATION

Code Enhancements to Ch 4: 403.3 Demand Control Ventilation

403.3.1.3 System operation. The minimum flow rate of outdoor air that the ventilation system must be capable of supplying during its operation shall be permitted to be based on the rate per person indicated in Table 403.3.1.1 and the actual number of occupants present. **Where demand-controlled ventilation is employed to adjust the outdoor airflow rate based on the actual number of occupants present, the minimum quantity of outdoor air shall not fall below that determined from the area outdoor airflow rate column of Table 403.3.1.1 during periods when the building is expected to be occupied.**

Commentary: The second sentence of this section addresses the issue of ventilation based on the floor area. Section 403.3.1.3 allows for demand control ventilation, which means that the ventilation rate can be adjusted up or down as the number of occupants in a space increases or decreases. The section might be misinterpreted that the ventilation rate could reduce to zero if the number of occupants was zero. However, it was never intended that the outdoor airflow rate per square foot prescribed by Table 403.3.1.1 could be overlooked when the occupant load in a space is zero. When the occupant load is zero, the minimum required ventilation rate is determined by the rate per square foot of floor area in the next to last column a of Table 403.3.1.1 times the net occupiable floor area of the space. Assuming the table has a prescribed airflow rate based on floor area for the space in a question in the table, there will always be some ventilation being provided, even when the space has no occupants.



$$V_{bz} = R_p P_z + R_a A_z$$

↑
**DCV
Minimum
airflow**

MECHANICAL UPDATES

TOPIC: CH 5 - EXHAUST SYSTEMS

Code Enhancements to Ch 5: 502 - Required Exhaust

Manicure/Pedicure Stations

502.20.1 Operation. The exhaust system for manicure and pedicure stations shall have controls that operate the system continuously when the space is occupied.



**Commentary Figure 502.20.1(1)
MANICURE AND PEDICURE
STATION EXHAUST SYSTEM
(Photo courtesy SalonSafe LLC)**

MECHANICAL UPDATES

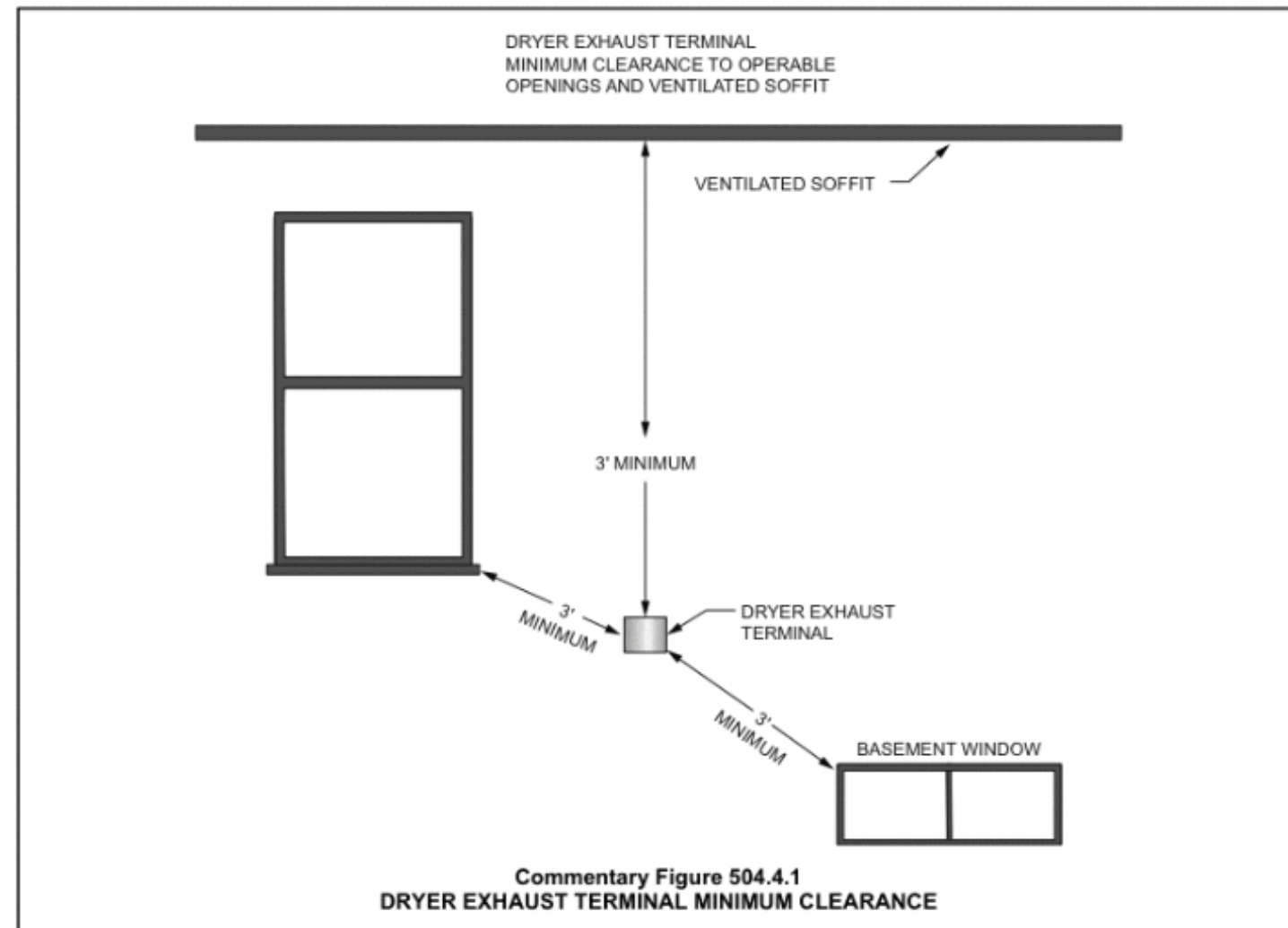
TOPIC: CH 5 - EXHAUST SYSTEMS

Code Enhancements to Ch 5: 504 - Clothes Dryer Exhaust

504.4 Exhaust installation. Dryer exhaust ducts for clothes dryers shall terminate on the outside of the building, **shall not terminate within 3 feet of a ventilated section in a soffit**, and shall be equipped with a back draft damper. Screens shall not be installed at the duct termination. Ducts shall not be connected or installed with sheet metal screws or other fasteners that will obstruct the exhaust flow. Clothes dryer exhaust ducts shall not be connected to a vent connector, vent, or chimney. Clothes dryer exhaust ducts shall not extend into or pass through ducts or plenums. **Clothes Dryer exhaust ducts shall be sealed in accordance with Section 603.9**

504.4.1 Termination location. Exhaust duct terminations shall be in accordance with the **dryer manufacturer's installation instructions**. Where the manufacturer's instructions do not specify a termination location, the exhaust duct shall terminate **not less than 3 feet in any direction from openings into buildings, including openings in ventilated soffits.**

504.4.2 Exhaust termination outlet and passageway size. The passageway of dryer exhaust duct terminals shall be undiminished in size and shall provide an open area of **not less than 12.5 square inches**



504.6 Booster fans prohibited. Domestic booster fans shall not be installed in dryer exhaust systems.

Use Dryer Exhaust Duct Power Ventilators (DEDPV) instead.

508.2 Duct Installation...

Where dryer exhaust ducts are enclosed in wall or ceiling cavities, such cavities shall allow the installation of the duct without deformation.

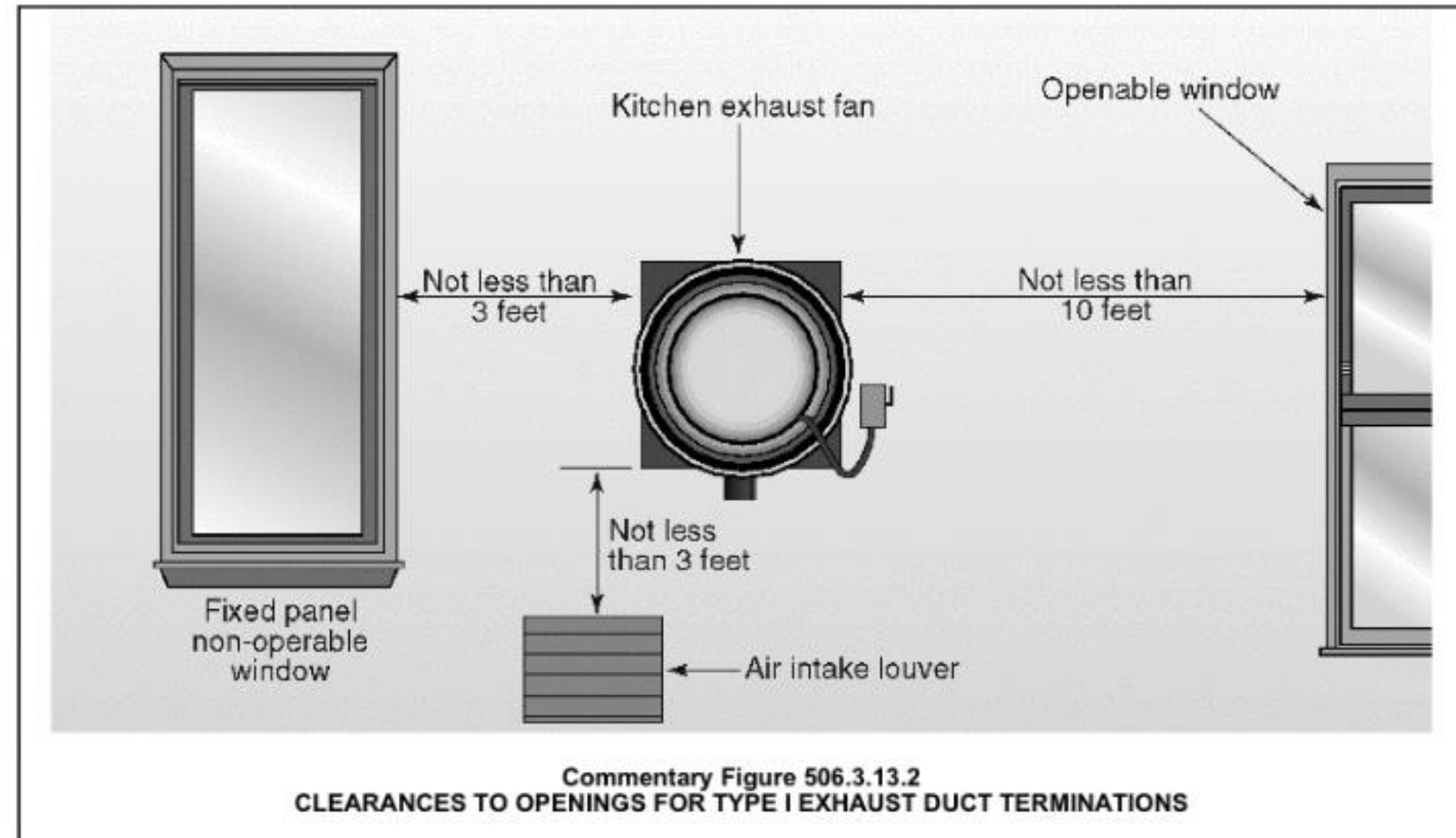
MECHANICAL UPDATES

TOPIC: CH 5 - EXHAUST SYSTEMS

Code Enhancements to Ch 5: 506.3.13 - Exhaust Outlets for Type 1 hoods

506.3.13.3 Termination location. Exhaust outlets shall be located not less than 10 feet horizontally from parts of the same or contiguous buildings, adjacent buildings and adjacent property lines and shall be located not less than 10 feet above the adjoining grade level. Exhaust outlets shall be located not less than 10 feet horizontally from or not less than 3 feet above air intake openings into any building.

Exception: Exhaust outlets shall terminate not less than 5 feet horizontally from parts of the same or contiguous building, an adjacent building, adjacent property line and air intake openings into a building where air from the exhaust outlet discharges away from such locations.



MECHANICAL UPDATES

TOPIC: CH 5 - EXHAUST SYSTEMS

Code Enhancements to Ch 5: 506.1, 506.3.6, 507.2.6
- Rules for commercial kitchen hoods

Rescinded

~~**506.1 Ventilation requirements for commercial kitchens.** Commercial kitchen hood ventilation ducts and exhaust equipment shall be in compliance with **NFPA-96-2014**, which is the standard of the national fire protection association listed in **Chapter 15** of the code.~~

Rescinded

~~**506.3.6 Grease duct clearances.** Grease duct systems and exhaust equipment serving a Type I hood shall have clearances to combustibles as required by **NFPA-96-2014**, as listed in **Chapter 15** of the code.~~

~~Exception: Listed and labeled factory-built commercial kitchen grease ducts and exhaust equipment installed in accordance with Section 304.1 of the code.~~

Rescinded

~~**507.2.6 Clearances for Type I hood.** A Type I hood shall be installed with clearances from combustibles as required by **NFPA-96-2014** as listed in **Chapter 15** of the code.~~

506.1 General. Commercial kitchen hood ventilation ducts and exhaust equipment shall comply with the requirements of this section. Commercial kitchen grease ducts shall be designed for the type of cooking appliance and hood served.

506.3.6 Grease duct clearances. Where enclosures are not required, grease duct systems and exhaust equipment serving a Type I hood shall have a clearance to combustible construction of not less than **18 inches** (457 mm), and shall have a clearance to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 3 inches (76 mm).

Exceptions:

1. Factory-built commercial kitchen grease ducts listed and labeled in accordance with UL 1978.
2. Listed and labeled exhaust equipment installed in accordance with Section 304.1.
3. Where commercial kitchen grease ducts are continuously covered on all sides with a listed and labeled field-applied grease duct enclosure material, system, product or method of construction specifically evaluated for such purpose in accordance with ASTM E2336, the required clearance shall be in accordance with the listing of such material, system, product or method.

507.2.6 Clearances for Type I hood. A Type I hood shall be installed with a clearance to combustibles of not less than **18 inches** (457 mm).

Exceptions:

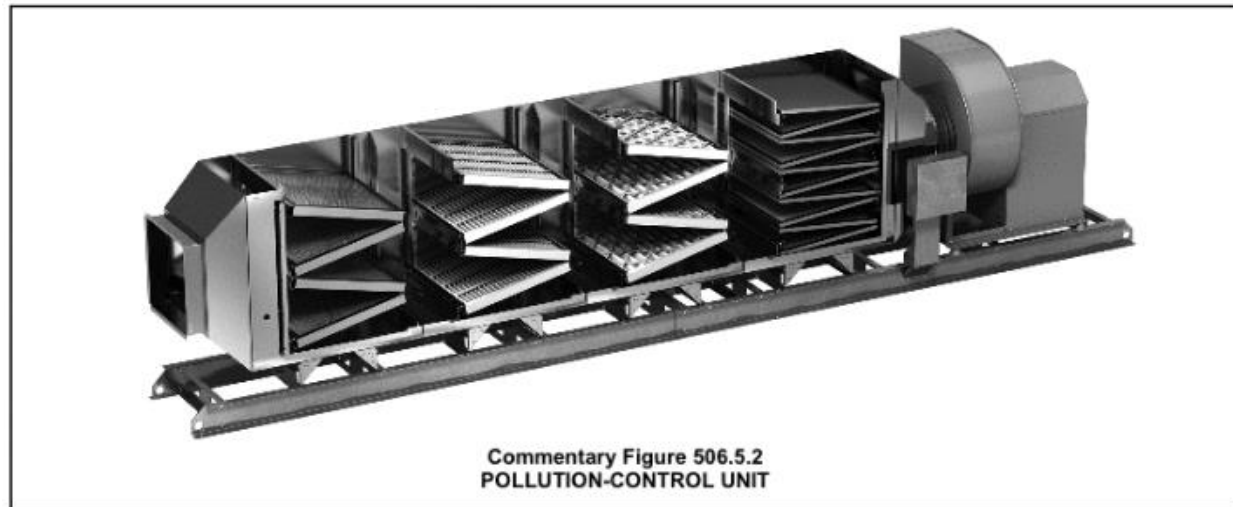
1. Clearance shall not be required from gypsum wall- 1 board or 1/2-inch (12.7 mm) or thicker cementitious 2 wallboard attached to noncombustible structures provided that a smooth, cleanable, nonabsorbent and noncombustible material is installed between the hood and the gypsum or cementitious wallboard over an area extending not less than 18 inches (457 mm) in all directions from the hood.
2. Type I hoods listed and labeled for clearances less than 18 inches (457 mm) in accordance with UL 710 shall be installed with the clearances specified by such listings.

MECHANICAL UPDATES

TOPIC: CH 5 - EXHAUST SYSTEMS

Code Enhancements to Ch 5: 506.5.2 - Pollution Control Units

(For extraction of smoke, grease, odors from kitchen hood exhaust)



506.5.2 Pollution-control units. The installation of pollution-control units shall be in accordance with all of the following:

1. Pollution-control units shall be listed and labeled in accordance with UL 8782.
2. Fans serving pollution-control units shall be listed and labeled in accordance with UL 762.
3. Bracing and supports for pollution-control units shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the International Building Code.
4. Pollution-control units located indoors shall be listed and labeled for such use. Where enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be listed and labeled, in accordance with UL 2221 or ASTM E2336, for location in an enclosure having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer's installation instructions.
5. Clearances shall be maintained between the pollution-control unit and combustible material in accordance with the listing.
6. Roof-mounted pollution-control units shall be listed for outdoor installation and shall be mounted not less than 18 inches (457 mm) above the roof.
7. Exhaust outlets for pollution-control units shall be in accordance with Section 506.3.13.
8. An airflow differential pressure control shall be provided to monitor the pressure drop across the filter sections of a pollution-control unit. When the airflow is reduced below the design velocity, the airflow differential pressure control shall activate a visual alarm located in the area where cooking operations occur.
9. Pollution-control units shall be provided with a factory-installed fire suppression system.
10. Service space shall be provided in accordance with the manufacturer's instructions for the pollution control unit and the requirements of Section 306.
11. Wash-down drains shall discharge through a grease interceptor and shall be sized for the flow. Drains shall be sealed with a trap or other approved means to prevent air bypass. Where a trap is utilized it shall have a seal depth that accounts for the system pressurization and evaporation between cleanings.
12. Protection from freezing shall be provided for the water supply and fire suppression systems where such systems are subject to freezing.
13. Duct connections to pollution-control units shall be in accordance with Section 506.3.2.3. Where water splash or carryover can occur in the transition duct as a result of a washing operation, the transition duct shall slope downward toward the cabinet drain pan for a length not less than 18 inches (457 mm). Ducts shall transition to the full size of the unit's inlet and outlet openings.
14. Extra-heavy-duty appliance exhaust systems shall not be connected to pollution-control units except where such units are specifically designed and listed for use with solid fuels.
15. Pollution-control units shall be maintained in accordance with the manufacturer's instructions.

MECHANICAL UPDATES

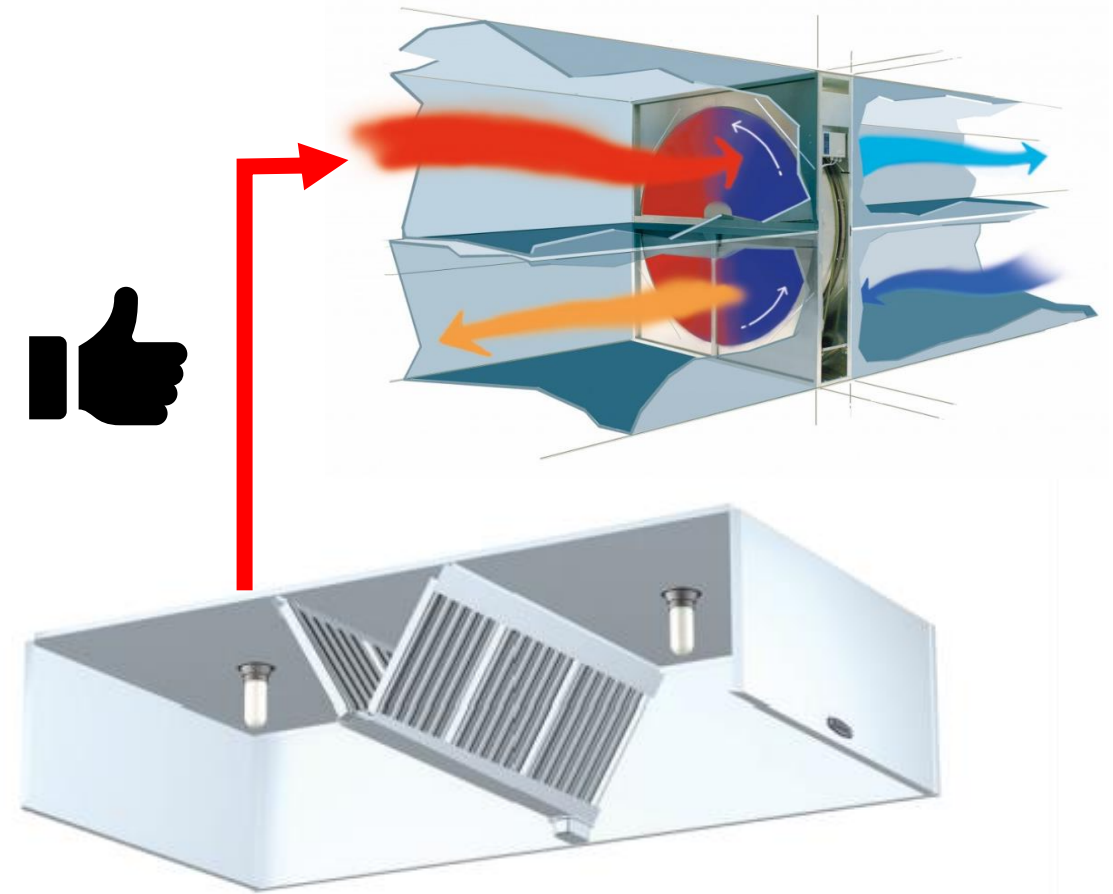
TOPIC: CH 5 - EXHAUST SYSTEMS

Code Enhancements to Ch 5: 514 Energy Recovery Ventilation Systems

514.2 Prohibited applications. Energy recovery ventilation systems shall not be used in the following systems:

1. Hazardous exhaust systems covered in Section 510.
2. Dust, stock and refuse systems that convey explosive or flammable vapors, fumes or dust.
3. Smoke control systems covered in Section 513.
4. Commercial kitchen exhaust systems serving Type I ~~or Type II~~ hoods.
5. Clothes dryer exhaust systems covered in Section 504.

Exception: The application of ERV equipment that recovers sensible heat only utilizing coil-type heat exchangers shall not be limited by this section.



**Type II Hoods
(Steam, Smoke only)**

MECHANICAL UPDATES

TOPIC: CH 5 - EXHAUST SYSTEMS

Code Enhancements to Ch 5: 510 Hazardous Exhaust

~~**510.4 Independent system.** Hazardous exhaust systems shall be independent of other types of exhaust systems.~~

501.2 Independent system required. Single or combined mechanical exhaust systems for environmental air shall be independent of all other exhaust systems. **Dryer, domestic kitchen and hazardous exhaust shall be independent of all other systems.** Type I exhaust systems shall be independent of all other exhaust systems except as provided in Section 506.3.5. Single or combined Type II exhaust systems for food- processing operations shall be independent of all other exhaust systems. Commercial kitchen exhaust systems shall be constructed in accordance with Sections 506 through 509.

MECHANICAL UPDATES

TOPIC: CH 5 - EXHAUST SYSTEMS

MI Amendments to Ch 5: 504.10 and 505.3 - Rescinded rules for common exhaust systems

Rescinded

504.10 Common exhaust systems for clothes dryers located in multistory structures. When a common multi-story duct system is designed and installed to convey exhaust from multiple clothes dryers, the system shall be engineered by a registered design professional and installed in accordance with the Michigan building construction codes.

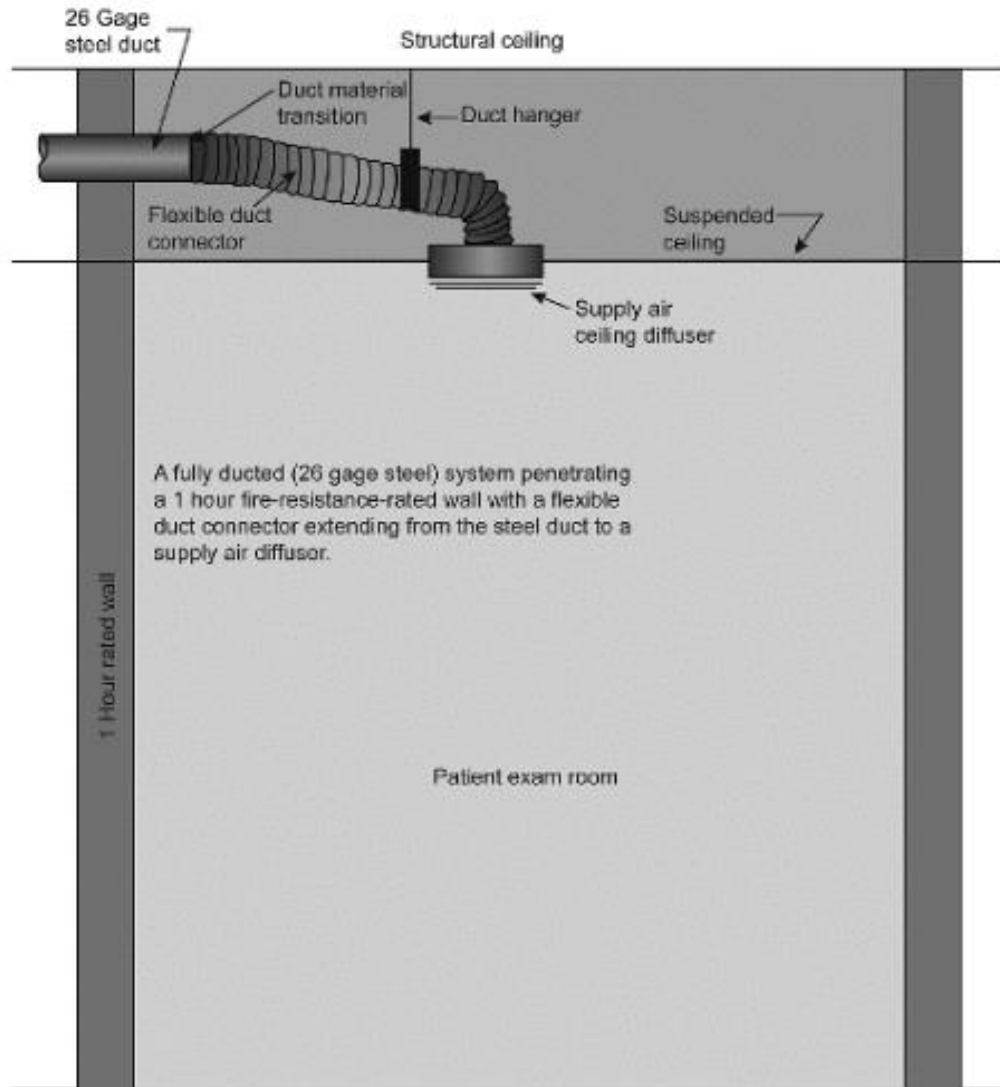
Rescinded

505.3 Common exhaust systems for domestic kitchens located in multistory structures. When a common multi-story duct system is designed and installed to convey exhaust from multiple domestic kitchens, the system shall be engineered by a registered design professional and installed in accordance with the Michigan building construction codes.

MECHANICAL UPDATES

TOPIC: CH 6 - DUCT SYSTEMS

Code Enhancements to Ch 6: 607 1 Hr Fire Barriers



GROUP I OCCUPANCY EQUIPPED
WITH AUTOMATIC SPRINKLER SYSTEM

Commentary Figure 607.5.2(2)
DUCT PENETRATION OF FIRE BARRIER

607.5.2 Fire barriers. Ducts and air transfer openings that penetrate fire barriers shall be protected with listed fire dampers installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for interior exit stairways and ramps and exit passageways except as permitted by Sections 1023.5 and 1024.6, respectively, of the International Building Code.

Exception: Fire dampers are not required at penetrations of fire barriers where any of the following apply:

1. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly.
2. Ducts are used as part of an approved smoke control system in accordance with Section 513 and where the fire damper would interfere with the operation of the smoke control system.
3. Such walls are penetrated by fully ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 of the International Building Code. For the purposes of this exception, a fully ducted HVAC system shall be a duct system for the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals. **Flexible air connectors shall be permitted in a fully ducted system, limited to the following installations:**

3.1. Nonmetallic flexible connections that connect a duct to an air handling unit or equipment located within a mechanical room in accordance with Section 603.9.

3.2. Nonmetallic flexible air connectors in accordance with Section 603.6.2 that connect an overhead metal duct to a ceiling diffuser where the metal duct and ceiling diffuser are located within the same room.

MECHANICAL UPDATES

TOPIC: CH 6 - DUCT SYSTEMS

Code Enhancements to Ch 6: 607 Sub Ducts in Shafts

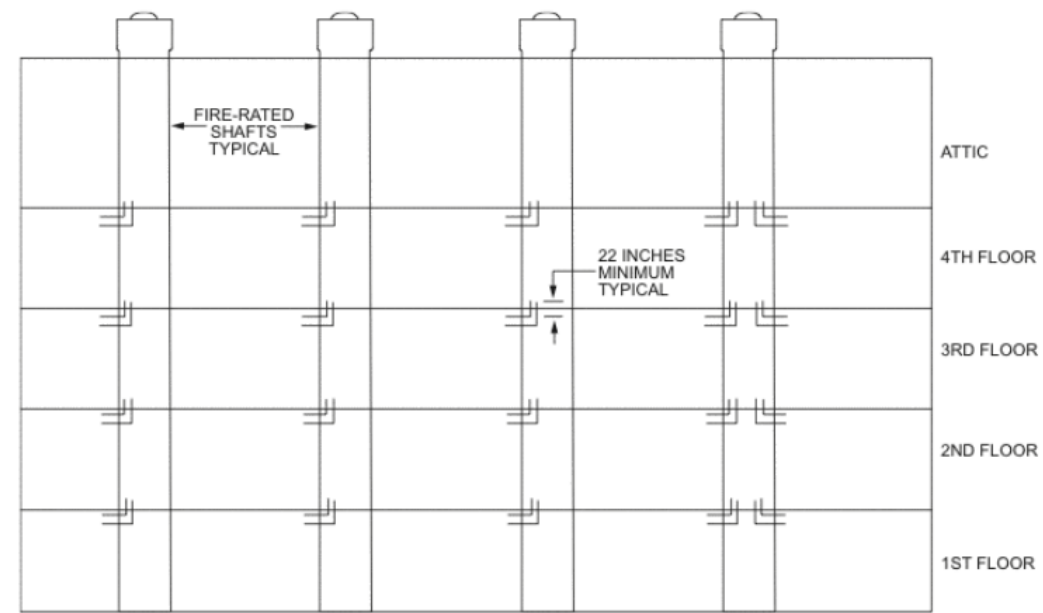
607.5.5 Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with listed fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where any of the following apply:

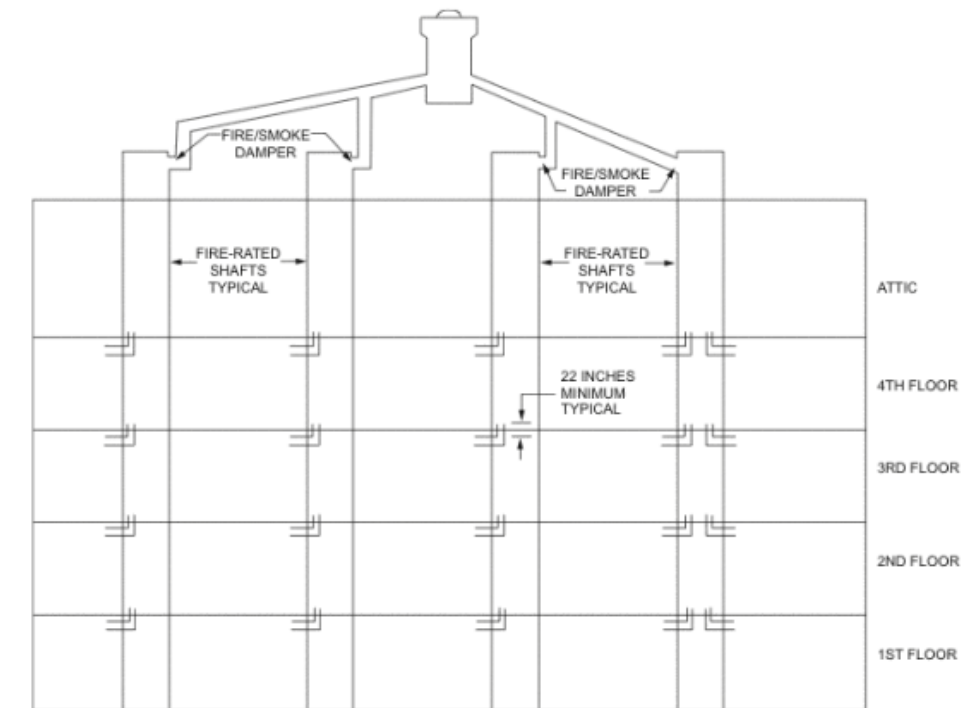
1.1. Steel exhaust subducts having a wall thickness of not less than 0.0187 inch (0.4712 mm) extend not less than 22 inches vertically in exhaust shafts **and an exhaust fan is installed at the upper terminus of the shaft that is powered continuously, in accordance with Section 909.11 of the International Building Code, so as to maintain a continuous airflow upward to the outdoors.**

607.5.5.1 Continuous upward flow. Fire dampers and smoke dampers shall not be installed in shafts that are required to maintain continuous airflow upward where closure of the damper would result in the loss of airflow.



SI: 1 inch = 25.4 mm.

Commentary Figure 607.5.5(1)
ACCEPTABLE METHOD OF SUBDUCTING



For SI: 1 inch = 25.4 mm.

Commentary Figure 607.5.5(2)
PROHIBITED METHOD OF SUBDUCTING

MECHANICAL UPDATES

TOPIC: CH 6 - DUCT SYSTEMS

Code Enhancements to Ch 6: 608 Balancing



SECTION 608 BALANCING

608.1 Balancing. Air distribution, ventilation and exhaust systems shall be provided with means to adjust the system to achieve the design airflow rates and shall be balanced by an approved method. Ventilation air distribution shall be balanced by an approved method and such balancing shall verify that the air distribution system is capable of supplying and exhausting the airflow rates required by Chapter 4.

MECHANICAL UPDATES

TOPIC: CH 9 - SPECIFIC APPLIANCES, FIREPLACES, AND SOLID FUEL-BURNING EQUIPMENT

Code Enhancements to Ch 9: 930 - Large Diameter Ceiling Fans

930.1 General. Where provided, large-diameter ceiling fans shall be tested and **labeled** in accordance with **AMCA 230, listed and labeled in accordance with UL 507**, and installed in accordance with the manufacturer's instructions.

Large-diameter ceiling fans are also referred to as **high-volume, low-speed (HVLS) fans**. These fans resemble the common ceiling paddle fans in homes and restaurants, but they are very large in diameter, measured across the plane of the blades, and the RPM speed is very low. The fans move large volumes of air by slow rotation of long blades and can be extremely quiet compared to higher speed fans. See the definition of "Large-diameter ceiling fan." They are used in large, open spaces with high ceilings such as warehouses, fleet garages, arenas, assembly areas, gymnasiums, barns, hangars, livestock containment areas, etc. Air currents are created that can turn over the air in a space, creating a cooling and ventilation effect without noise and objectionable air movement and can also reduce stratification of air in the heating season. The primary benefits of these fans are providing human and animal comfort, helping to control condensation and stratification problems, and saving energy used for conditioning the air in spaces.



MECHANICAL UPDATES

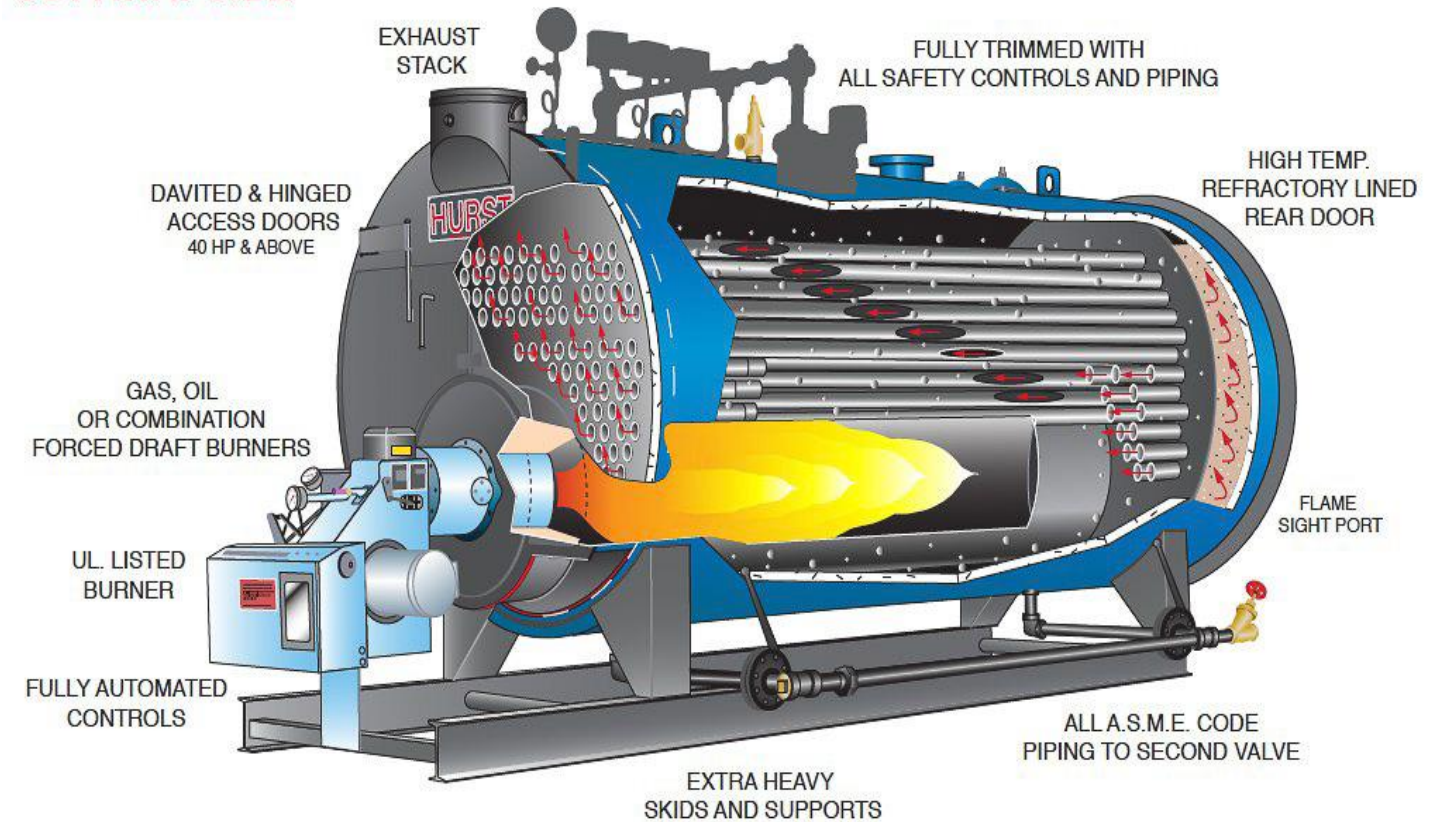
TOPIC: CH 10 - BOILERS, WATER HEATERS AND PRESSURE VESSELS

MI Amendments to Ch 10: 1001.2 & 1001.3 - “Michigan Boiler Code”

1001.2. Boilers. In addition to the other provisions of the code, this article governs the installation, alteration, and repair of water heaters and boilers. **The installation of boilers shall comply with the provisions of this code and the skilled trades regulation act, 2016 PA407, MCL 339.5101 to 339.6133.**

1001.3 Alterations and repairs. Alterations and repairs to boilers shall be in accordance with the **skilled trades regulation act, 2016 PA 407, MCL 339.5101 to 339.6133.**

CUT AWAY VIEW



“Michigan Boiler Code” rules now part of the “skilled trades regulation act”

MECHANICAL UPDATES

TOPIC: CH 11 – REFRIGERATION

Code Enhancements to Ch 11: 1101 Scope

Several requirements for Ammonia have been removed. References to IIAR have been adopted.



ANSI/ASHRAE Standard 15.2-2022

Safety Standard for Refrigeration Systems in Residential Applications

Approved by ASHRAE and the American National Standards Institute on April 29, 2022.

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. Instructions for how to submit a charge can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 180 Technology Parkway NW, Peachtree Corners, GA 30092. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

© 2022 ASHRAE ISSN 1041-2336



REFRIGERATION SECTION 1101 GENERAL

1101.1 Scope. This chapter shall govern the design, installation, construction and repair of refrigeration systems that vaporize and liquefy a fluid during the refrigerating cycle. Permanently installed refrigerant storage systems and other components shall be considered as part of the refrigeration system to which they are attached.

1101.1.1 Refrigerants other than ammonia. Refrigerant piping design and installation for systems containing a refrigerant other than ammonia, including pressure vessels and pressure relief devices, shall **comply with this chapter and ASHRAE 15.**

1101.1.2 Ammonia refrigerant. Refrigeration systems using ammonia as the refrigerant shall **comply with IIAR 2, IIAR 3, IIAR 4 and IIAR 5** and shall not be required to comply with this chapter.

MECHANICAL UPDATES

TOPIC: CH 11 – REFRIGERATION

Code Enhancements to Ch 11: Table 1103.1 – Refrigerant Tables Updated

TABLE 1103.1—continued
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD*
				Pounds per 1,000 cubic feet	ppm	g/m ³	OEL*	
R-600	CH ₃ CH ₂ CH ₂ CH ₃	butane	A3	0.15	1,000	2.4	1,000	1-4-0
R-600a	CH(CH ₃) ₂ CH ₃	2-methylpropane (isobutane)	A3	0.59	4,000	9.6	1,000	2-4-0
R-601	CH ₃ CH ₂ CH ₂ CH ₂ CH ₃	pentane	A3	0.18	1,000	2.9	600	—
R-601a	(CH ₃) ₂ CHCH ₂ CH ₃	2-methylbutane (isopentane)	A3	0.18	1,000	2.9	600	—
R-610	CH ₃ CH ₂ OCH ₂ CH ₃	ethoxyethane (ethyl ether)	—	—	—	—	400	—
R-611	HCOOCH ₃	methyl formate	B2	—	—	—	100	—
R-718	H ₂ O	water	A1	—	—	—	—	0-0-0
R-744	CO ₂	carbon dioxide	A1	4.5	40,000	72	5,000	2-0-0 ^b
R-1130(E)	CHCl=CHCl	trans-1,2-dichloroethene	B1	0.25	1,000	4	200	—
R-1132a	CF ₂ =CH ₂	1,1-difluoroethylene	A2	2.0	13,000	33	500	—
R-1150	CH ₂ =CH ₂	ethene (ethylene)	A3	—	—	—	200	1-4-2
R-1224yd(Z)	CF ₃ CF=CHCl	(Z)-1-chloro-2,3,3,3-tetrafluoroethylene	A1	23	60,000	360	1,000	—
R-1233zd(E)	CF ₃ CH=CHCl	trans-1-chloro-3,3,3-trifluoro-1-propene	A1	5.3	16,000	85	800	—
R-1234yf	CF ₃ CF=CH ₂	2,3,3,3-tetrafluoro-1-propene	A2 ^c	4.7	16,000	75	500	—
R-1234ze(E)	CF ₃ CH=CHF	trans-1,3,3,3-tetrafluoro-1-propene	A2 ^c	4.7	16,000	75	800	—
R-1270	CH ₃ CH=CH ₂	Propene (propylene)	A3	0.1	1,000	1.7	500	1-4-1
R-1336mzz(Z)	CF ₃ CHCHCF ₃	cis-1,1,1,4,4,4-hexafluoro-2-butene	A1	5.4	13,000	87	500	—

MECHANICAL UPDATES

TOPIC: CH 11 – REFRIGERATION

Code Enhancements to Ch 11: 1106.4 Group A2L Refrigerants

TABLE 1106.4.2
MINIMUM EXHAUST RATES

REFRIGERANT	Q(m/sec)	Q(cfm)
R32	15.4	32,600
R143	13.6	28,700
R444A	6.46	13,700
R444B	10.6	22,400
R445A	7.83	16,600
R446A	23.9	50,700
R447A	23.8	50,400
R451A	7.04	15,000
R451B	7.05	15,000
R1234yf	7.80	16,600
R1234ze(E)	5.92	12,600

They are referred to as “mildly flammable” and are HFC or HFO compounds or blends of such. A2L refrigerants have a slower burning velocity and a higher minimum ignition energy

1106.3 Flammable refrigerants. Where refrigerants of Groups A2, A3, B2 and B3 are used, the machinery room shall conform to the Class I, Division 2, hazardous location classification requirements of NFPA 70.

Exception: Machinery rooms for systems containing Group A2L refrigerants that are provided with ventilation in accordance with Section 1106.4.

1106.4 Special requirements for Group A2L refrigerant machinery rooms. Machinery rooms with systems containing Group A2L refrigerants that do not conform to the Class I, Division 2, hazardous location electrical requirements of NFPA 70, as permitted by the exception to Section 1106.3, shall comply with Sections 1106.4.1 through 1106.4.3.

Exception: Machinery rooms conforming to the Class I, Division 2, hazardous location classification requirements of NFPA 70 are not required to comply with Sections 1106.4.1 and 1106.4.2.

1106.4.1 Ventilation system activation. Ventilation shall be activated by the refrigerant detection system in the machinery room. Refrigerant detection systems shall be in accordance with Section 608.9 of the International Fire Code and all of the following:

1. The detectors shall activate at or below a refrigerant concentration of 25 percent of the LFL.
2. Upon activation, the detection system shall activate the emergency ventilation system required by Section 1106.4.2.
3. The detection, signaling and control circuits shall be supervised.

1106.4.2 Emergency ventilation system. An emergency ventilation system shall be provided at the **minimum exhaust rate specified in ASHRAE 15 or Table 1106.4.2.** Shutdown of the emergency ventilation system shall be by manual means.

1106.4.3 Emergency ventilation system discharge. The emergency ventilation system point of discharge to the atmosphere shall be located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, ventilation opening or exit.

MECHANICAL UPDATES

ASHRAE 15 (2022) – A2L REFRIGERANTS

(Re)classified to include “mildly flammable” (A2L)



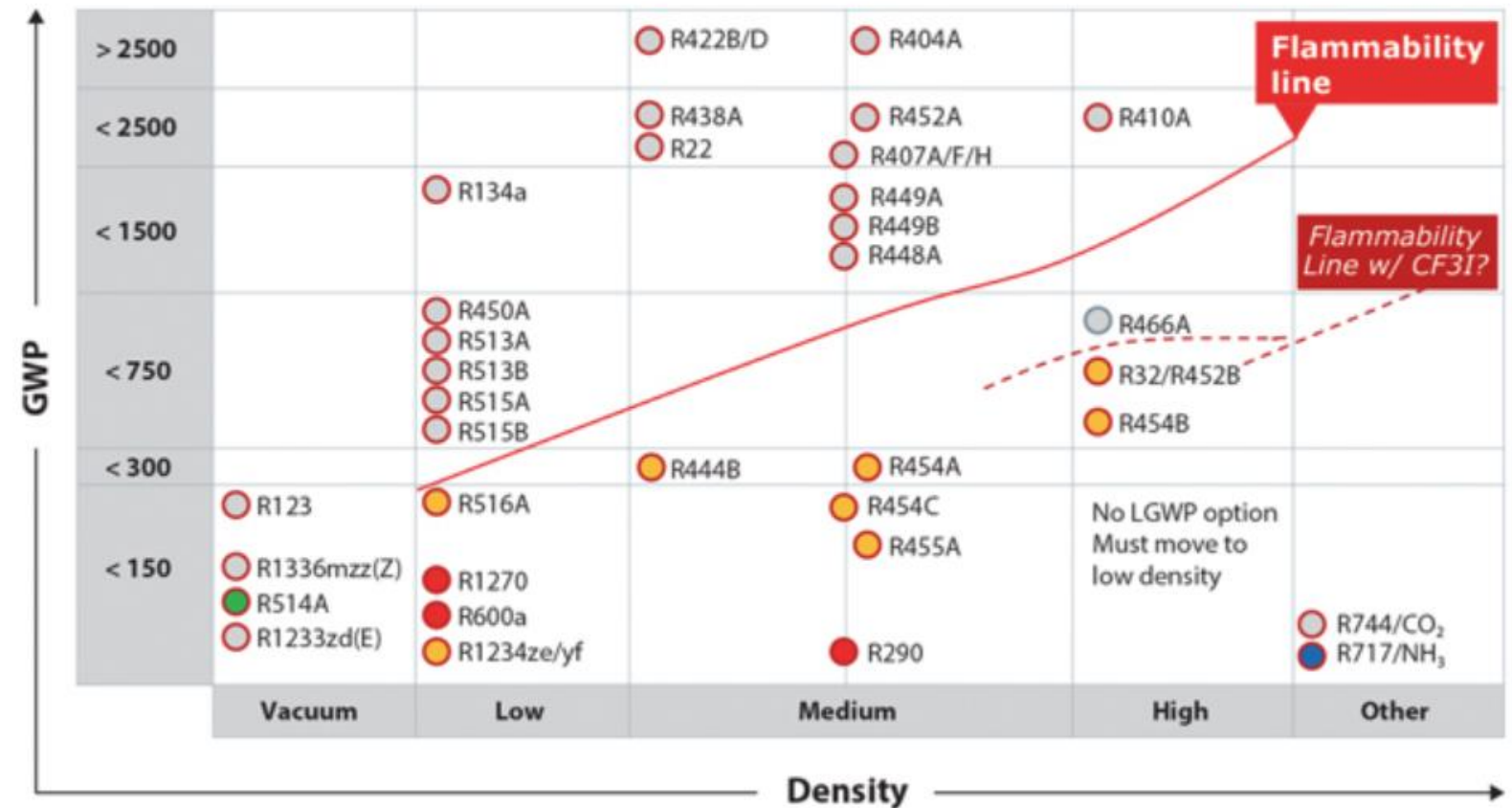
ANSI/ASHRAE Standard 15.2-2022

Safety Standard for Refrigeration Systems in Residential Applications



Legend

- A1 – Non-flammable
- A3 – Highly flammable
- B2L – Toxic – less flammable
- On the market
- A2L – Mildly flammable
- B1 – Toxic – non-flammable
- Not yet on the market



MECHANICAL UPDATES

ASHRAE 15 (2022) – A2L REFRIGERANTS

- High- vs Low-Probability Systems
- Refrigerant Charge Limits
- UL Listing Requirements
- Refrigerant Detection and Mitigation Systems
- Mechanical Ventilation Requirements
- Refrigerant Piping Enclosures
- Extra Requirements for A2L/B2L refrigerants



ANSI/ASHRAE Standard 15.2-2022

Safety Standard for Refrigeration Systems in Residential Applications

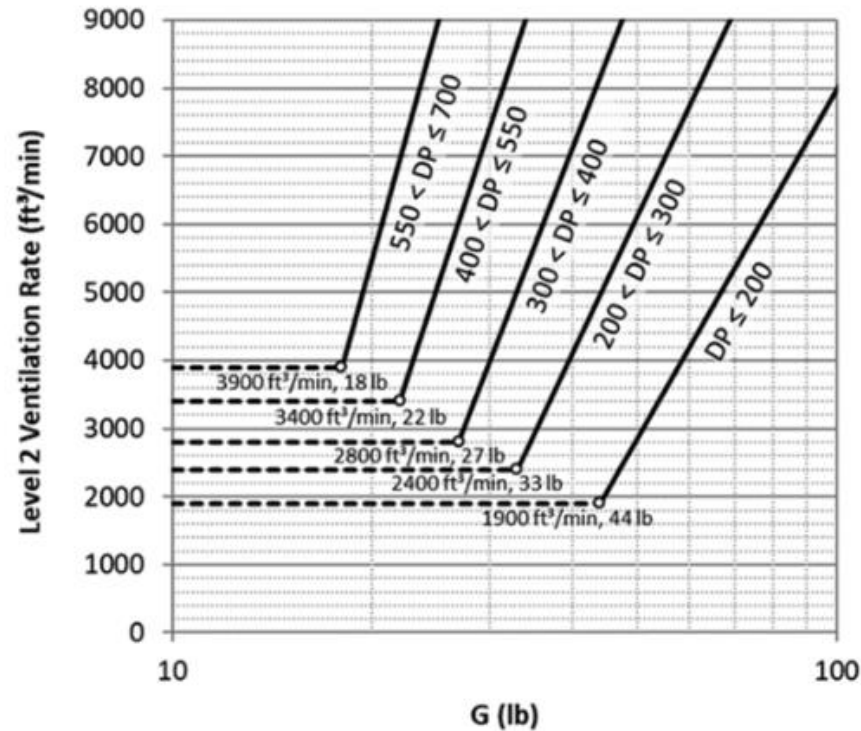
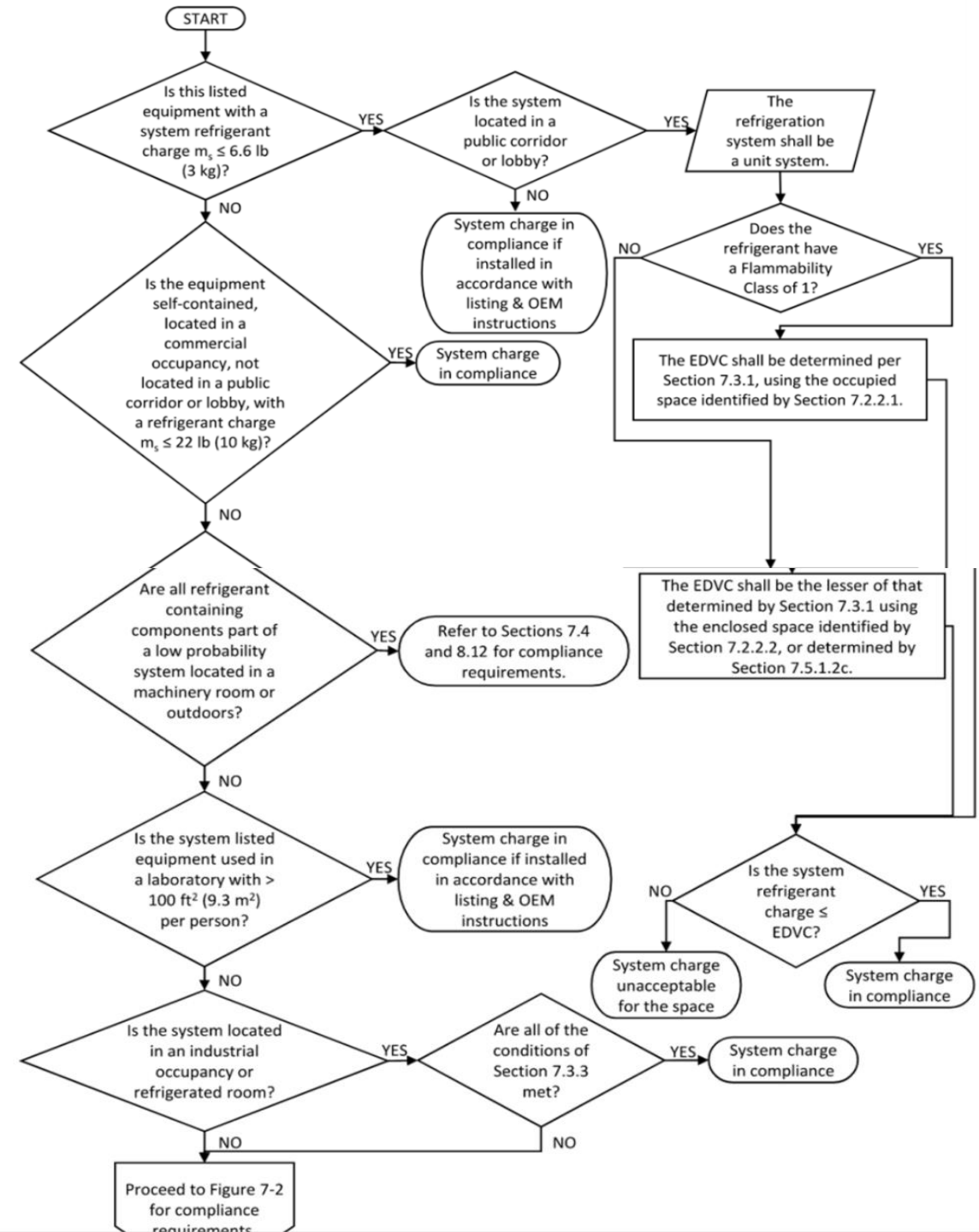


Figure 8-1 (a) Level 2 ventilation rate for Class 2L refrigerants (I-P) with (b) detail.

© ASHRAE. Per international copyright law, additional reproduction, distribution, or transmission in either print or digital form is not permitted without ASHRAE's prior written permission.



MECHANICAL UPDATES

TOPIC: CH 11 – REFRIGERATION

Code Enhancements to Ch 11: 1105.6.1.1

1105.6.1 Discharge location. The discharge of the air shall be to the outdoors in accordance with Chapter 5. Exhaust from mechanical ventilation systems shall be discharged not less than 20 feet (6096 mm) from a property line or openings into buildings.

1105.6.1.1 Indoor exhaust opening location. Indoor mechanical exhaust intake openings shall be located where refrigerant leakage is likely to concentrate based on the refrigerant's relative density to air, and the locations of the air current paths and refrigerating machinery.

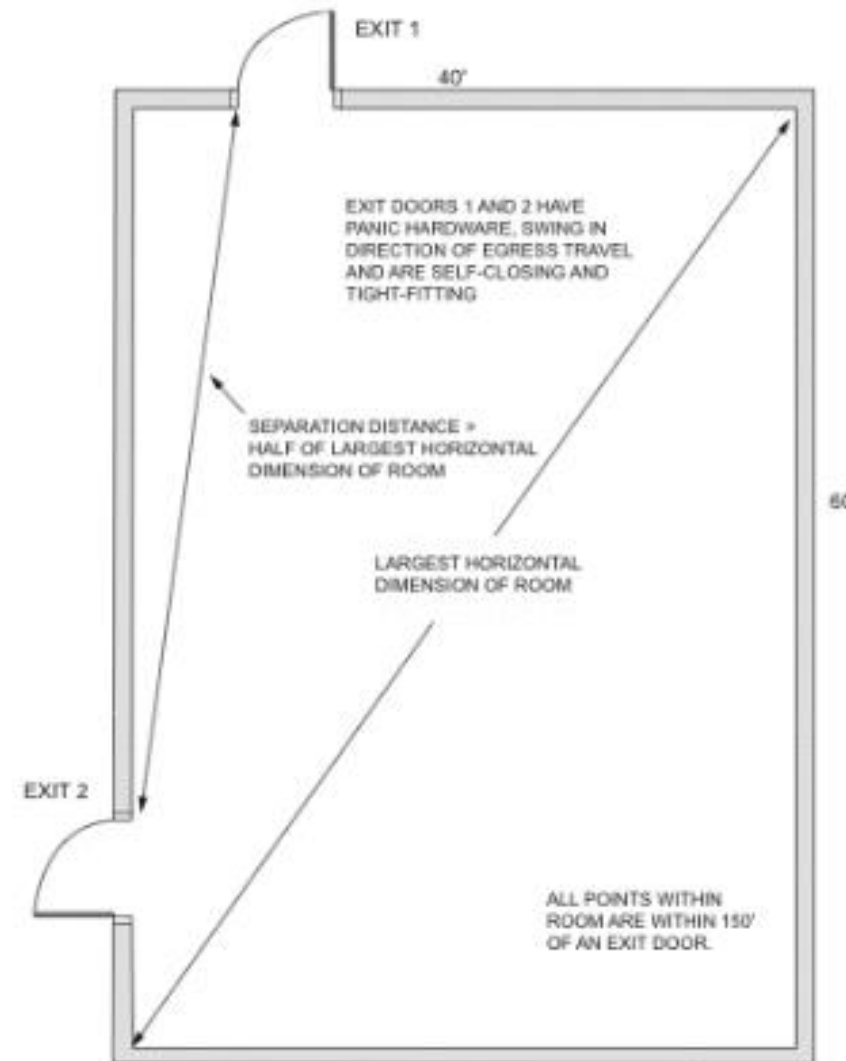
MECHANICAL UPDATES

TOPIC: CH 11 – REFRIGERATION

Code Enhancements to Ch 11: 1105.9 Machinery Room Requirements

1105.9 Means of egress. Machinery rooms larger than 1,000 square feet shall have not less than two exits or exit access doorways. Where two exit access doorways are required, one such doorway is permitted to be served by a fixed ladder or an alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of the room. All portions of machinery rooms shall be within 150 feet of an exit or exit access doorway. An increase in exit access travel distance is permitted in accordance with Section 1017.1 of the International Building Code. **Exit and exit access doorways shall swing in the direction of egress travel and shall be equipped with panic hardware,** regardless of the occupant load served. Exit and exit access doorways shall be tight fitting and self-closing.

Egress requirements for machinery rooms are contained in the IBC but were not previously duplicated in the IMC. **The IBC egress coverage is added to the IMC and is also revised relative to panic hardware.** It is appropriate for refrigeration machinery rooms to have panic hardware on means of egress doors to protect occupants from the risk of a rapid release of hazardous or asphyxiant gases.



Commentary Figure 1105.9(2)
MACHINERY ROOM EGRESS DOOR
(Courtesy of gettyimages.com/-MG-)

MECHANICAL UPDATES

TOPIC: CH 11 – REFRIGERATION

Code Enhancements to Ch 11: 1107, 1108, 1109, 1110 – Sections Rewritten

SECTION 1107 PIPING MATERIAL

1107.1 Piping. Refrigerant piping material for other than R-717 (ammonia) systems shall conform to the requirements in this section. Piping material and installations for R-717 (ammonia) refrigeration systems shall comply with IIAR 2.

...

SECTION 1108 JOINTS AND CONNECTIONS

1108.1 Approval. Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the refrigerant system when tested in accordance with Section 1110.

...

SECTION 1109 REFRIGERANT PIPE INSTALLATION

1109.1 General. Refrigerant piping installations, other than R-717 (ammonia) refrigeration systems, shall comply with the requirements of this section. The design of refrigerant piping shall be in accordance with ASME B31.5.

...

SECTION 1110 REFRIGERATION PIPING SYSTEM TEST

1110.1 General. Refrigerant piping systems, other than R-717 (ammonia) refrigeration systems, that are erected in the field shall be pressure tested for strength and leak tested for tightness, in accordance with the requirements of this section, after installation and before being placed in operation. Tests shall include both the high- and low-pressure sides of each system.

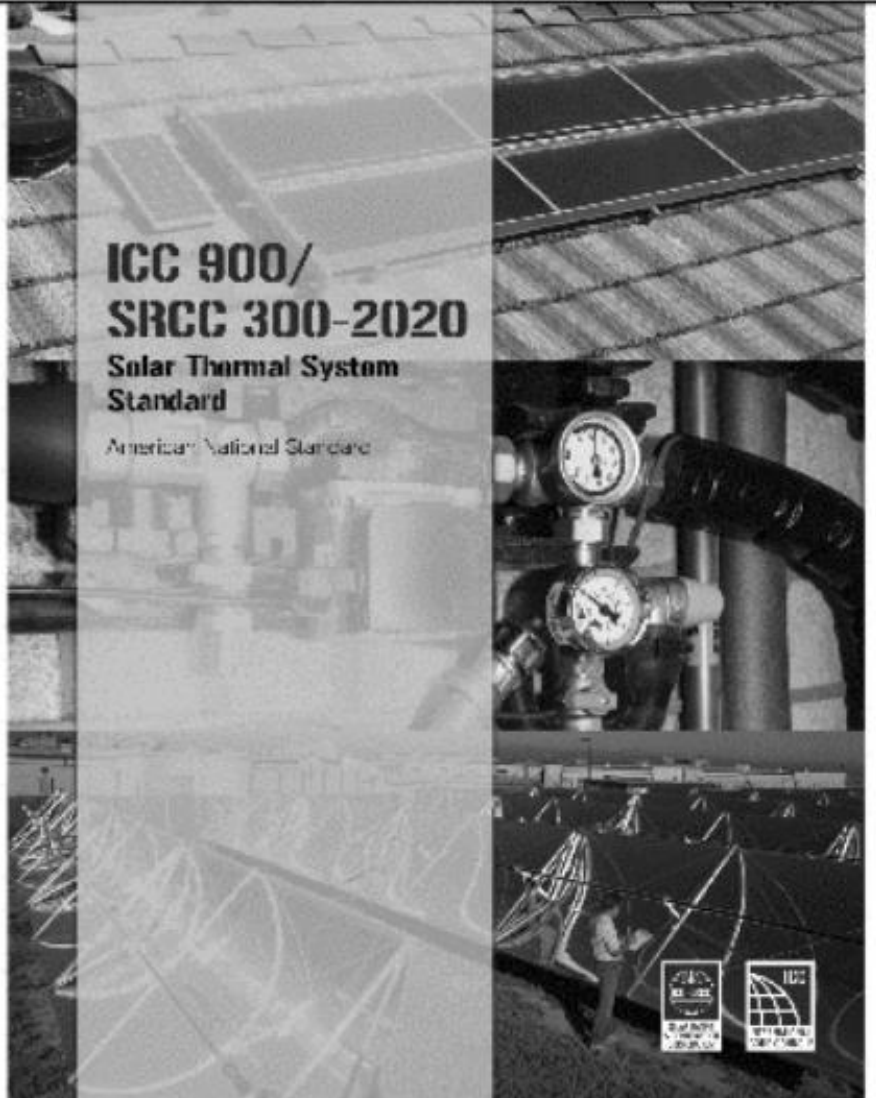
Exception: Listed and labeled equipment, including compressors, condensers, vessels, evaporators, gas bulk storage tanks, safety devices, pressure gauges and control mechanisms, shall not be required to be tested.

...

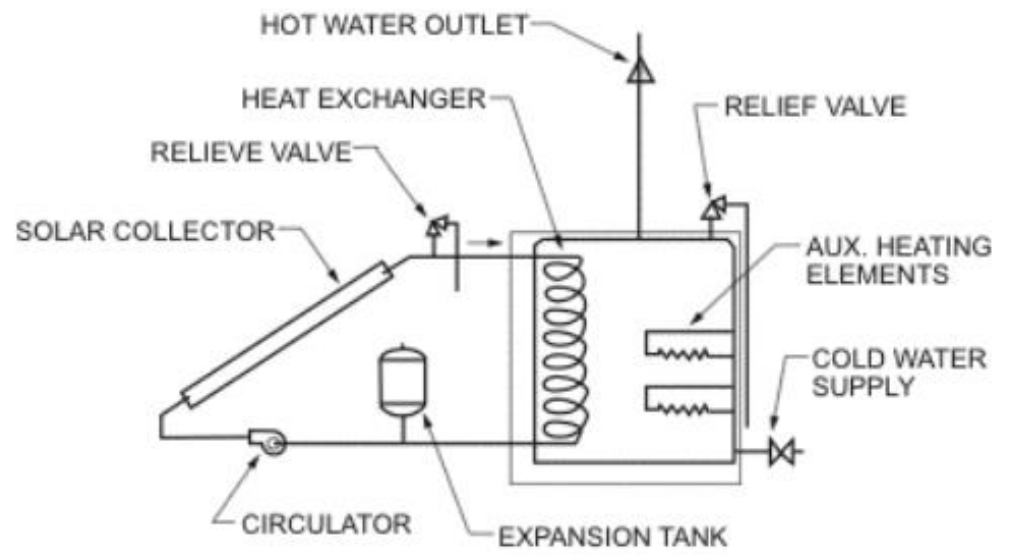
Mechanical refrigeration systems that are field constructed must be pressure tested. Factory-assembled components that have been factory tested can be excluded from this testing requirement. Self-contained, factory-built equipment that bears the label of an approved agency does not require field testing because the code official can determine from information provided on the label that the equipment has been tested at the factory. After a refrigeration system is assembled, a pressure test using an inert gas is required to determine whether the system leaks.

MECHANICAL UPDATES

TOPIC: CH 14 - SOLAR THERMAL SYSTEMS



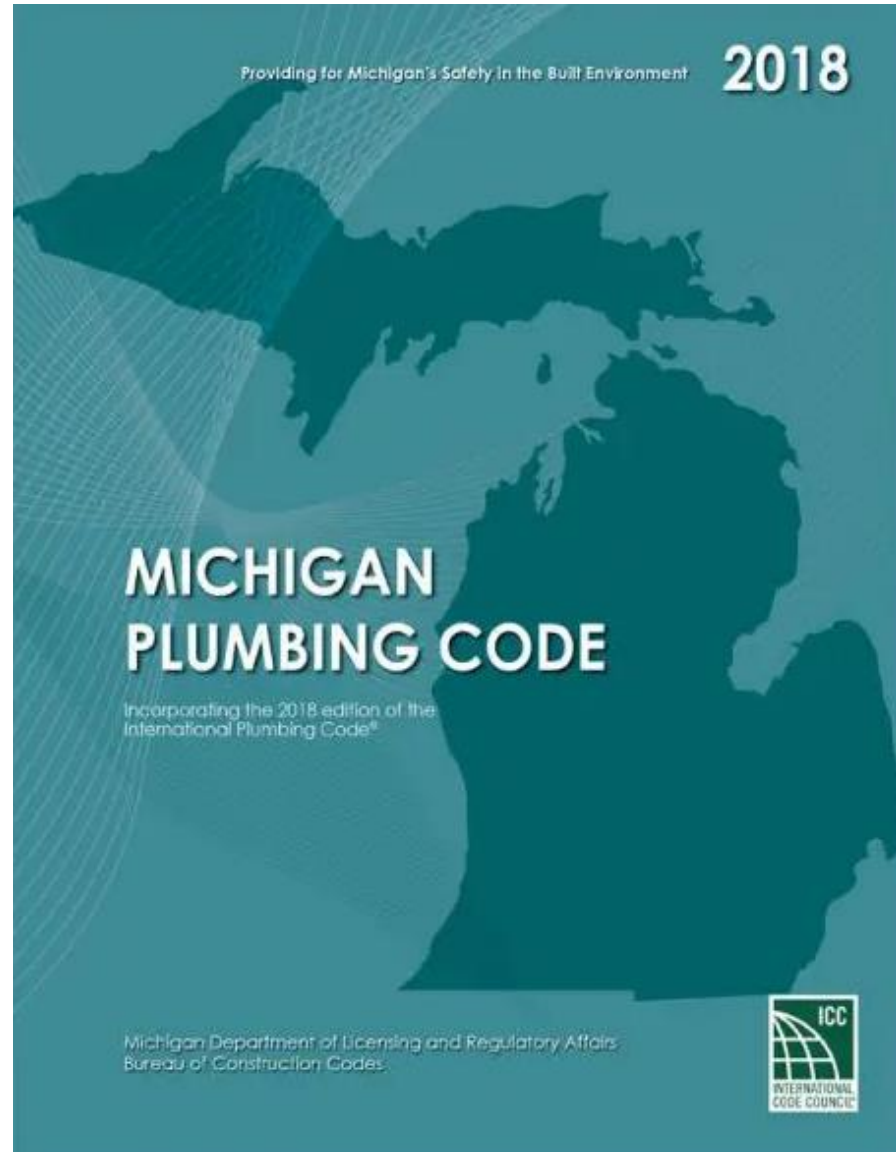
- SECTION 1401: GENERAL
- SECTION 1402: DESIGN AND INSTALLATION
- SECTION 1403: HEAT TRANSFER FLUIDS
- SECTION 1404: LABELING



Commentary Figure 1401.4.1
SOLAR THERMAL COLLECTORS AND
PANELS SHALL BE LISTED AND LABELED IN
ACCORDANCE WITH ICC 901/SRCC 100

Commentary Figure 1401.4
SOLAR THERMAL SYSTEMS
SHALL BE LISTED AND LABELED
IN ACCORDANCE WITH ICC 900/SRCC 300

PLUMBING UPDATES



PLUMBING UPDATES

MPC 2018 TO IPC 2021 WITH STATE AMENDMENTS

- Chapter 1: Scope and Administration
- Chapter 2: Definitions
- Chapter 3: General Regulations
- **Chapter 4: Fixtures, Faucets, and Fixture Fittings**
 - **403 Minimum Plumbing Facilities (MI Amendments)**
 - 407 Bathtubs – Min 1-1/2” Overflows
 - **410 Drinking Fountains**
 - **411 Emergency Showers and Eyewash Stations**
- Chapter 5: Water Heaters – Minor Changes
- **Chapter 6: Water Supply and Distribution**
 - **605 Materials, Joints, and Connections (MI Amendments)**
 - 606 Installation of the Building Water Distribution System (MI Amendments) – Multi-Tenant Meters
 - **607 Hot Water Supply System (MI Amendments)**
- **Chapter 7: Sanitary Drainage**
 - **702 Materials (MI Amendments)**
 - 705 Joints – PVC-DWV
 - **708 Cleanouts**
 - **717 Relining Building Sewers and Building Drains**
- Chapter 8: Indirect/Special Waste – Minor Changes
- **Chapter 9: Vents**
 - **903 Vent Terminals**
 - 915 Combination Waste and Vent Systems – Food Waste Disposer
- Chapter 10: Traps, Interceptors and Separators
 - 1002 Trap Requirements (MI Amendments) – Minor Changes
- **Chapter 11: Storm Drainage**
 - **1102 Materials (MI Amendments)**
 - **1106 Size of Conductors, Leaders and Storm Drains**
- Chapter 12: Special Piping and Storage Systems – Minor Changes
- Chapter 13: Nonpotable Water Systems - Excluded
- Chapter 14: Subsurface Graywater Soil Absorption Systems – Excluded
- Chapter 15: Referenced Standards

PLUMBING UPDATES

TOPIC: CH4 - FIXTURES, FAUCETS, AND FIXTURE FITTINGS

MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES

MI Amendments to Ch 4: Table 403.1 - Changes ONLY

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410.1)	OTHER
				MALE	FEMALE	MALE	FEMALE			
1	Assembly	A-2 ^d	Casino gaming areas	1 per 100 for the first 400 and 1 per 250 for the remainder exceeding 400	1 per 50 for the first 400 and 1 per 150 for the remainder exceeding 400	1 per 250 for the first 750 and 1 per 500 for the remainder exceeding 750			1 per 1,000	1 service sink
		A-5 (h)	Stadiums, amusement parks, bleachers, and grandstands for outdoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 120 for the remainder exceeding 1,520	1 per 200	1 per 150		1 per 1,000	1 service sink
		A-5	Outdoor educational and municipal venues not larger than 3,000 spectators	1 per 125	1 per 65	1 per 200	1 per 150		1 per 1,000	1 service sink
5	Institutional	I-1	Residential Custodial care facilities	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		I-2	Hospitals, and ambulatory-nursing homes patients, care recipient	1 per room c		1 per room c		1 per 15	1 per 100	1 service sink per floor
			Employees, in hospitals and nursing homes other than residential care	1 per 25		1 per 35			1 per 100	
			Visitors, other than residential care in hospitals and nursing homes	1 per 75		1 per 100			1 per 500	
I-3	Employees in reformatories, detention centers and correctional centers	1 per 25		1 per 35			1 per 100			
8	Storage (h)	S-1 S-2	Structure for the storage of goods, warehouses, storehouses, and freight depots. Low and moderate hazard.	1 per 100		1 per 100			1 per 1,000	1 service sink

~~h. Structures not designed for occupants or as an employee's regular working area, are not required to have toilet facilities.~~

~~i. Water closets and lavatories in adjacent school buildings may be included in the required minimum fixture count, if they are located within a 500-foot walking distance to the stadium. Signage for the location of these rest rooms is required.~~

PLUMBING UPDATES

TOPIC: CH4 – FIXTURES, FAUCETS, AND FIXTURE FITTINGS

Code Enhancements to Ch 4: 403 – Toilet Facilities

403.1.1 Fixture calculations. To determine the occupant load of each sex, the total occupant load shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple occupancies, such fractional numbers for each occupancy shall first be summed and then rounded up to the next whole number.

Exceptions:

1. The total occupant load shall not be required to be divided in half where approved statistical data indicates a distribution of the sexes of other than 50 percent of each sex.
2. **Where multiple-user facilities are designed to serve all genders, the minimum fixtures count shall be calculated at 100%, based on total occupant load. The minimum number of required plumbing fixtures shall be in accordance with table 403.1. (MI Amendment) In multiple-user facilities, each fixture type shall be in accordance with ICC A117.1 and each urinal that is provided shall be located in a stall.**
3. Distribution of the sexes is not required where single-user water closets and bathing room fixtures are provided in accordance with section 403.1.2.

403.1.2 Single-user toilet facility and bathing room fixtures. The plumbing fixtures located in single-user toilet facilities and bathing rooms, including family or assisted-use toilet and bathing rooms that are required by Section 1110.2.1 of the International Building Code, shall contribute toward the total number of required plumbing fixtures for a building or tenant space. Single-user toilet facilities and bathing rooms, and family or assisted-use toilet rooms and bathing rooms shall be identified as being available for use by all persons regardless of their sex.

The total number of fixtures shall be permitted to be based on the required number of separate facilities or based on the aggregate of any combination of single-user or separate facilities.

403.2 Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex.

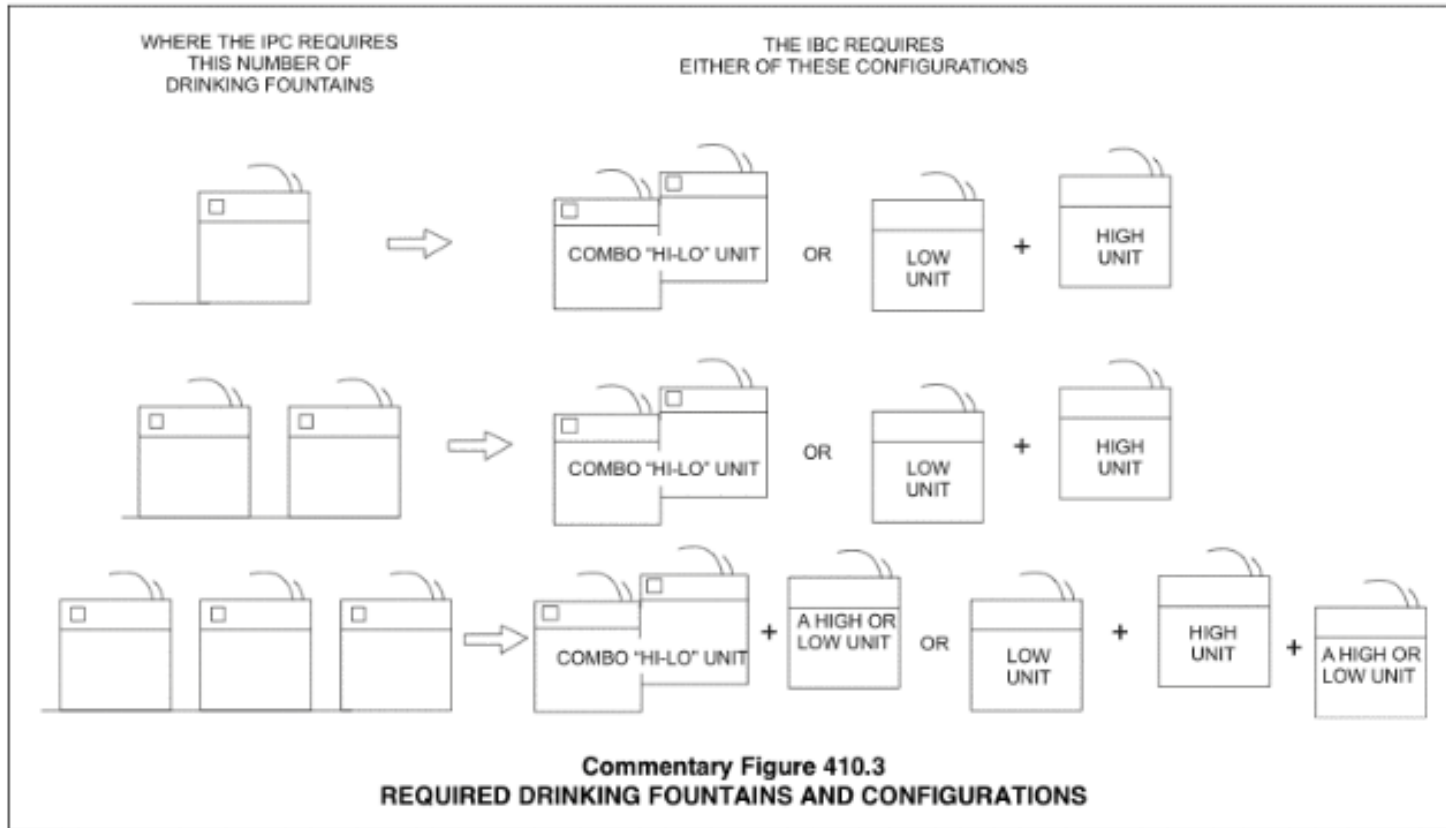
Exceptions:

1. ~~Separate facilities shall not be required for private facilities.~~ **Separate facilities shall not be required for dwelling units and sleeping units.**
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. Separate facilities shall not be required in mercantile occupancies in which the maximum occupant load is ~~50~~ 100 or fewer.
4. **Separate facilities shall not be required in business occupancies in which the maximum occupant load is 25 or fewer.**
5. **Separate facilities shall not be required to be designated by sex where single-user toilet rooms are provided in accordance with Section 403.1.2.**
6. **Separate facilities shall not be required where rooms having both water closets and lavatory fixtures are designed for use by both sexes and privacy for water closets is provided in accordance with Section 405.3.4. Urinals shall be located in an area visually separated from the remainder of the facility or each urinal that is provided shall be located in a stall.**

PLUMBING UPDATES

TOPIC: CH4 – FIXTURES, FAUCETS, AND FIXTURE FITTINGS

Code Enhancements to Ch 4: 410 – Drinking Fountains



410.3 High and low drinking fountains. Where drinking fountains are provided on an exterior site, on a floor or within a secured area, the drinking fountains shall be provided in accordance with Sections 410.3.1 and 410.3.2.

410.3.1 Minimum number. Not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

Exceptions:

1. A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
2. Where drinking fountains are primarily for children's use, the drinking fountains for people using wheel- chairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.
3. Referencing building code for all height requirements of drinking fountains and water coolers. (MI Amendment)

410.3.2 More than the minimum number. Where more than the minimum number of drinking fountains specified in Section 410.3.1 is provided, 50 percent of the total number of drinking fountains provided shall comply with the requirements for persons who use a wheelchair and 50 percent of the total number of drinking fountains provided shall comply with the requirements for standing persons.

Exceptions:

1. Where 50 percent of the drinking fountains yields a fraction, 50 percent shall be permitted to be rounded up or down, provided that the total number of drinking fountains complying with this section equals 100 percent of the drinking fountains.
2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.

PLUMBING UPDATES

TOPIC: CH4 - FIXTURES, FAUCETS, AND FIXTURE FITTINGS

Code Enhancements to Ch 4: 411 - Emergency Fixtures

411.3 Water supply. Where hot and cold water is supplied to an emergency shower or eyewash station, the temperature of the water supply shall only be controlled by a temperature- actuated mixing valve complying with ASSE 1071. **Where water is supplied directly to an emergency shower or eyewash station from a water heater, the water heater shall comply with ASSE 1085, section 607.1.2.**

*An emergency shower or an eyewash station requires a specially designed mixing valve for delivering water at the correct temperature for rinsing/flushing chemicals from the user's affected body areas. This requirement applies only where both a hot and a cold water supply are connected to the emergency shower or eye wash station. **Other designs for supplying water supply at the correct temperature to such equipment are not regulated by this section. Supply directly from a water heater compliant with ASSE 1085 is incapable of producing water with a temperature exceeding 100°F.***

- ASSE 1085: Water Heaters For Emergency Equipment
- ASSE 1071: Emergency Tempering Valves



Commentary Figure 411.1
EMERGENCY SHOWER AND EYEWASH STATION
(Photo courtesy of B&I Contractors, Inc.)

PLUMBING UPDATES

TOPIC: CH6 - WATER SUPPLY AND DISTRIBUTION

Code Enhancements & MI Amendments to Ch 6: 607 - Hot Water Supply System

~~**607.1.2 Tempered water temperature control.** Tempered water shall be supplied through a water temperature limiting device that conforms to ASSE 1070/ASME A112.1070/CSA B125.70 and shall limit the tempered water to not greater than **110 degrees F**. This provision shall not supersede the requirement for protective shower valves in accordance with Section 412.3.~~

607.1.2. Tempered water temperature control. Tempered water shall be controlled by 1 of the following:

1. A limiting device conforming to ASSE 1070/ASME A112.1070/CSA B125.70 and set to not greater than 110 degrees Fahrenheit or 43 degrees Celsius.
- 2. A thermostatic mixing valve conforming to ASSE 1017.**
- 3. A water heater conforming to ASSE 1082.**
- 4. A water heater conforming to ASSE 1084.**
- 5. Emergency eye wash tepid water limits shall not be less than 60 degrees Fahrenheit or 15.6 degrees Celsius and not greater than 100 degrees Fahrenheit or 37.8 degrees Celsius and conform to ASSE 1071.**

- **ASSE 1017: Master Mixing Valves**
- **ASSE 1082: Water Heaters with Integral Temperature Control (Distributed)**
- **ASSE 1084: Water Heaters with Temperature Limiting Capacity (Point of Use)**
- **ASSE 1071: Emergency Tempering Valves**

PLUMBING UPDATES

TOPIC: CH7 – SANITARY DRAINAGE

Code Enhancements to Ch 7: 708 – Cleanouts

708.1.6 Cleanout equivalent. A fixture trap or a fixture with integral trap, removable without altering concealed piping, shall be acceptable as a cleanout equivalent.

Fixtures such as urinals and water closets that can be removed are considered acceptable means of accessing the drainage system for clearing of blockages. The code limits the removal of water closets to provide cleanout access for building sewers (see Section 708.1.3). Exception 1 of Section 708.1.5 further limits the use of a removable P-trap as a cleanout, unless servicing the same size pipe, or one size larger than the P-trap used.



PLUMBING UPDATES

TOPIC: CH7 – SANITARY DRAINAGE

Code Enhancements to Ch 7: 717

SECTION 717 RELINING BUILDING SEWERS AND BUILDING DRAINS

717.1 General. This section shall govern the relining of existing building sewers and building drainage piping.

717.2 Applicability. The relining of existing building sewers and building drainage piping shall be limited to gravity drainage piping 4 inches (102 mm) in diameter and larger. The relined piping shall be of the same nominal size as the existing piping.

717.3 Preinstallation requirements. Prior to commencement of the relining installation, the existing piping sections to be relined shall be descaled and cleaned. After the cleaning process has occurred and water has been flushed through the system, the piping shall be inspected internally by a recorded video camera survey.

717.3.1 Preinstallation recorded video camera survey. The video survey shall include verification of the project address location. The video shall include notations of the cleanout and fitting locations, and the approximate depth of the existing piping. The video shall also include notations of the length of piping at intervals not greater than 25 feet (7620 mm).

717.4 Permitting. Prior to permit issuance, the code official shall review and evaluate the preinstallation recorded video camera survey to determine if the piping system is able to be relined in accordance with the proposed lining system manufacturer's installation requirements and applicable referenced standards.

717.5 Prohibited applications. Where review of the preinstallation recorded video camera survey reveals that piping systems are not installed correctly or defects exist, relining shall not be permitted. The defective portions of piping shall be exposed and repaired with pipe and fittings in accordance with this code. Defects include, but are not limited to, back-grade or insufficient slope, complete pipe wall deterioration or complete separations such as from tree root invasion or improper support.

717.6 Relining materials. The relining materials shall be manufactured in compliance with applicable standards and certified as required in Section 303. Fold-and-form pipe reline materials shall be manufactured in compliance with ASTM F1504 or ASTM F1871.

717.7 Installation. The installation of relining materials shall be performed in accordance with the manufacturer's installation instructions, applicable referenced standards and this code.

717.7.1 Material data report. The installer shall record the data as required by the relining material manufacturer and applicable standards. The recorded data shall include but is not limited to the location of the project, relining material type, amount of product installed and conditions of the installation. A copy of the data report shall be provided to the code official prior to final approval.

717.8 Post-installation recorded video camera survey. The completed, relined piping system shall be inspected internally by a recorded video camera survey after the system has been flushed and flow-tested with water. The video survey shall be submitted to the code official prior to finalization of the permit. The video survey shall be reviewed and evaluated to provide verification that no defects exist. Any defects identified shall be repaired and replaced in accordance with this code.

717.9 Certification. A certification shall be provided in writing to the code official, from the permit holder, that the relining materials have been installed in accordance with the manufacturer's installation instructions, the applicable standards and this code.

717.10 Approval. Upon verification of compliance with the requirements of Sections 717.1 through 717.9, the code official shall approve the installation.

PLUMBING UPDATES

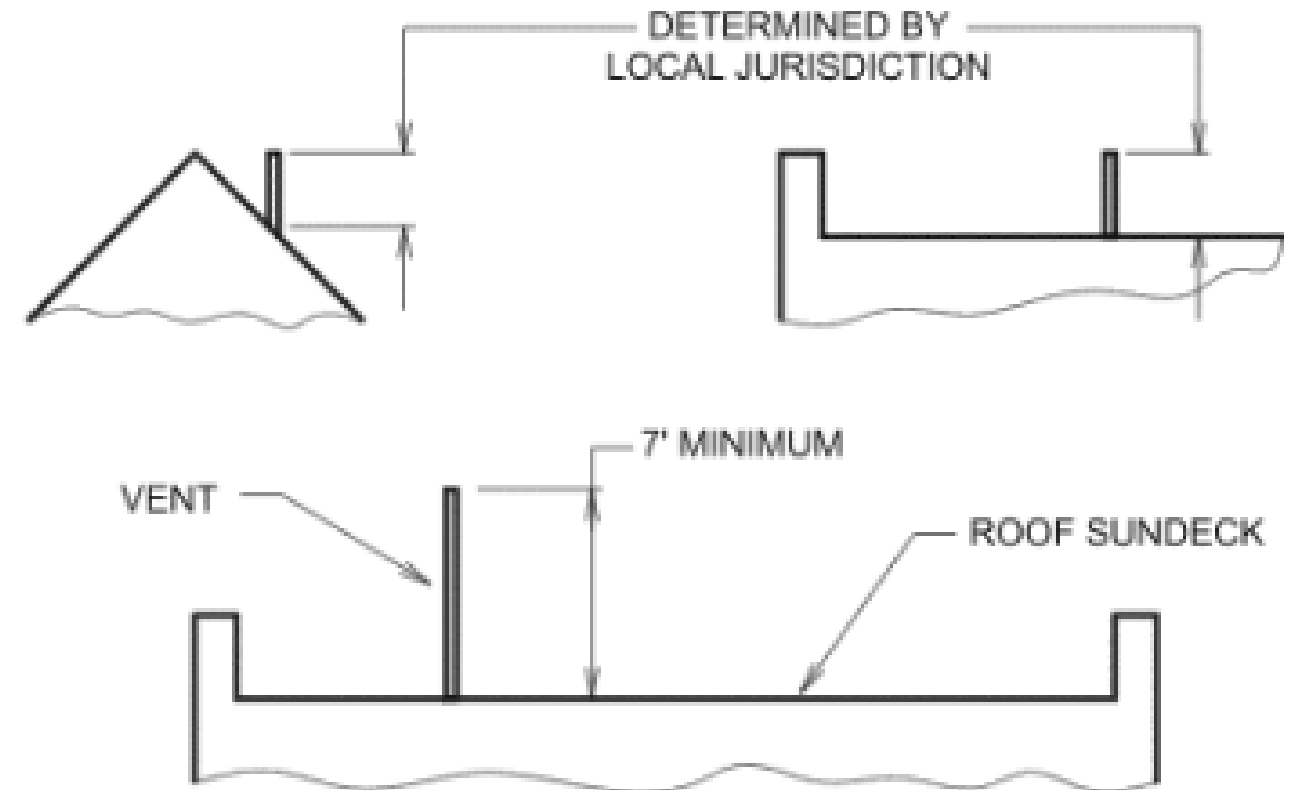
TOPIC: CH9 - VENTS

Code Enhancements to Ch 9: 903 - Vent Terminals

903.1.1. Roof extension unprotected. Open vent pipes that extend through a roof shall be **terminated not less than 12 inches above the roof.**

903.1.2 Roof used for recreational or assembly purposes. Where a roof is to be used as a promenade, restaurant, bar, or sunbathing deck, as an observation deck, or for similar purposes, open vent pipes shall terminate not less than **7 feet (2134 mm) above the roof.**

903.1.3 Protected vent terminal. Where an open vent pipe terminates above a sloped roof and is covered by either a roof-mounted panel (such as a solar collector or photovoltaic panel mounted over the vent opening) or a roof element (such as an architectural feature or a decorative shroud), the vent pipe shall **terminate not less than 2 inches above the roof surface. Such roof elements shall be designed to prevent the adverse effects of snow accumulation and wind on the function of the vent.** The placement of a panel over a vent pipe and the design of a roof element covering the vent pipe shall provide for an open area for the vent pipe to the outdoors that is not less than the area of the pipe, as calculated from the inside diameter of the pipe. **Such vent terminals shall be protected by a method that prevents birds and rodents from entering or blocking the vent pipe opening.**



Commentary Figure 903.1
VENT TERMINAL

PLUMBING UPDATES

TOPIC: CH11 - STORM DRAINAGE

Code Enhancements to Ch 11: 1106 – Size of Conductors, Leaders, and Storm Drains

1106.2 Size of storm drain piping. Vertical and horizontal storm drain piping shall be sized based on the flow rate through the roof drain. **The flow rate, as calculated in accordance with Section 1106.2.1, shall be checked against the roof drain manufacturer’s published flow rate for the specific roof drain model and size to verify that the selected roof drain will handle the anticipated flow.** The flow rate in storm drain piping shall not exceed that specified in Table 1106.2.

1106.2.1. Rainfall rate conversion method. The rainfall rate falling on a roof surface shall be converted to a gallon per minute (L/m) flow rate in accordance with equation 11-1.

$$GPM = R \times A \times 0.0104 \quad \text{(Equation 11-1)}$$

Where:
R = Rainfall intensity in inches per hour.
A = Roof area in square feet.

**TABLE 1106.2
 STORM DRAIN PIPE SIZING**

PIPE SIZE (inches)	CAPACITY (gpm)				
	VERTICAL DRAIN	SLOPE OF HORIZONTAL DRAIN			
		1/16 inch per foot	1/8 inch per foot	1/4 inch per foot	1/2 inch per foot
2	34	15	22	31	44
3	87	39	55	79	111
4	180	81	115	163	231
5	311	117	165	234	331
6	538	243	344	487	689
8	1,117	505	714	1,010	1,429
10	2,050	927	1,311	1,855	2,623
12	3,272	1,480	2,093	2,960	4,187
15	5,543	2,508	3,546	5,016	7,093

PLUMBING UPDATES

TOPIC: CH6 – WATER SUPPLY AND DISTRIBUTION, CH7 – SANITARY DRAINAGE, CH11 – STORM DRAINAGE

MI Amendments to Ch 6: 605, 702 – Materials

Table 605.3

WATER SERVICE PIPE

MATERIAL	STANDARD
Galvanized steel pipe	ASTM A53

Table 605.4

WATER DISTRIBUTION PIPE

MATERIAL	STANDARD
Galvanized steel pipe	ASTM A53

Table 605.5

PIPE FITTINGS

MATERIAL	STANDARD
Galvanized steel pipe	ASTM A53

Table 702.4

SANITARY PIPE FITTINGS

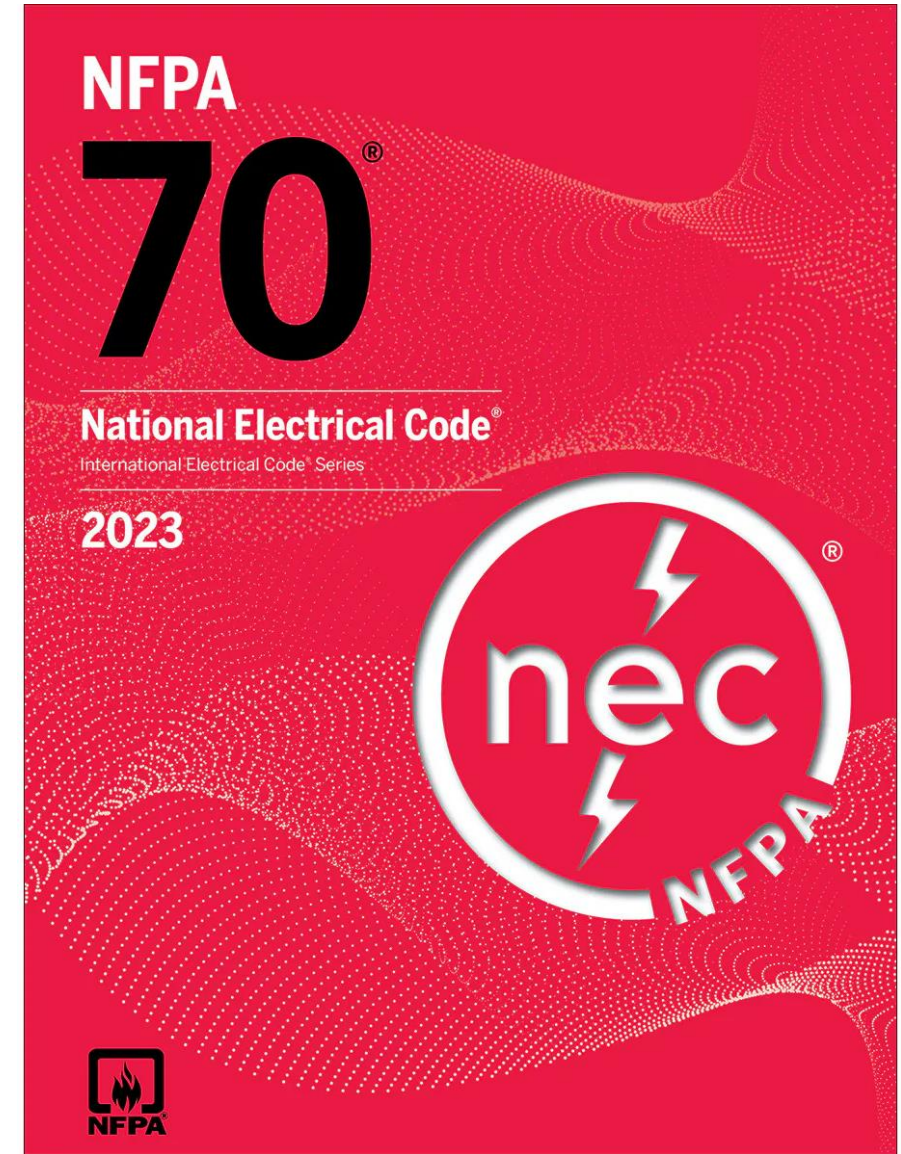
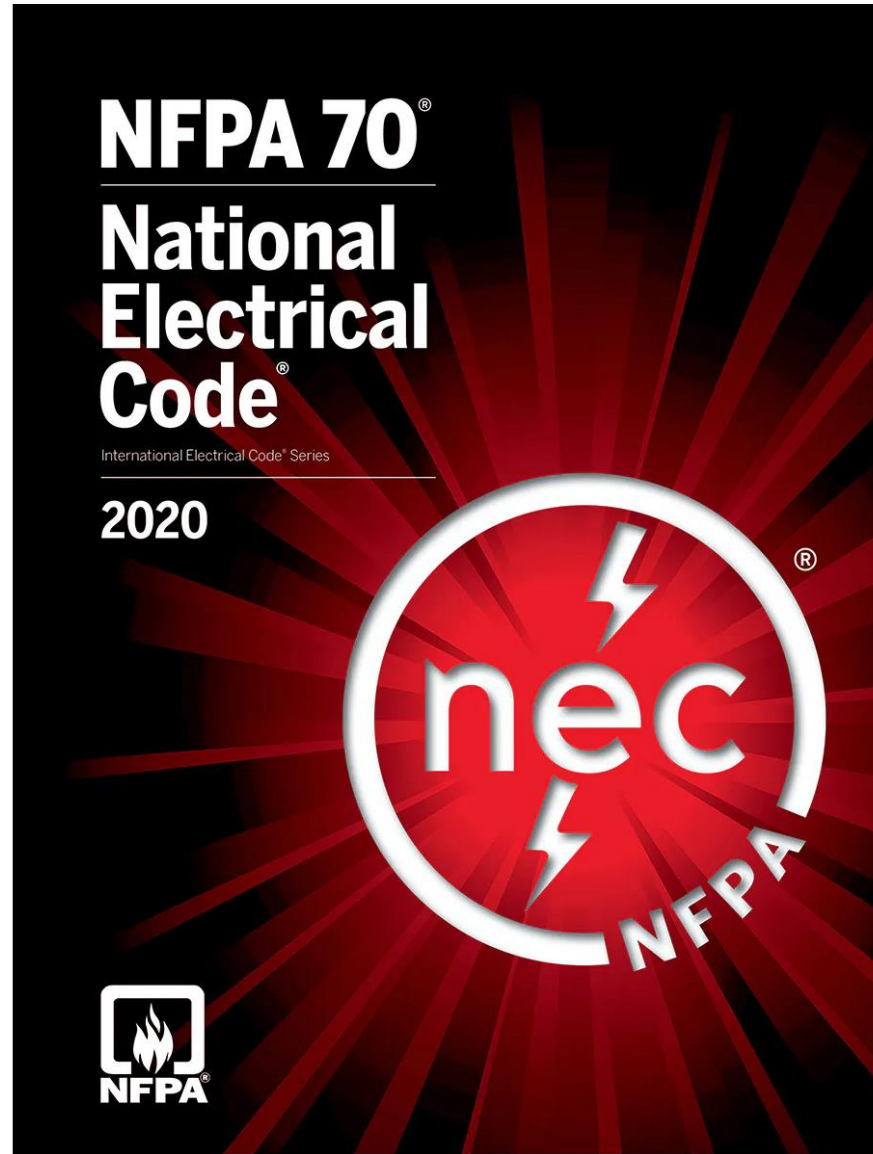
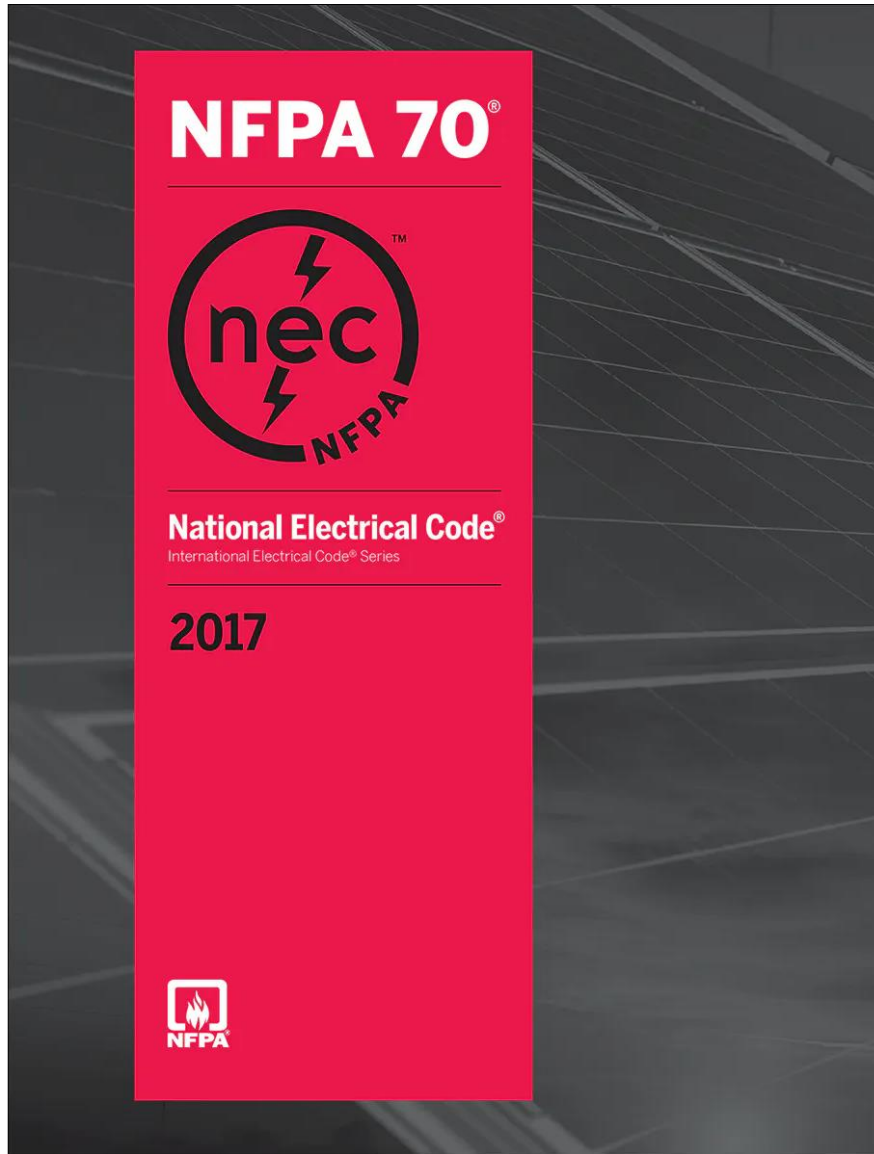
MATERIAL	STANDARD
Galvanized steel pipe	ASTM A53

Table 1102.4

BUILDING STORM SEWER PIPE

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F667; ASTM F2306/F2306; ASTM F2648/F2548M ; F2648/F2648M
Polypropylene (PP) plastic pipe	ASTM F2736; ASTM F2764; CSA B182.13
Polyvinyl chloride (PVC) plastic pipe (Type DWV, SDR26, SDR35, SDR41, PS50 or PS100) in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall	ASTM D2665; ASTM D3034; ASTM F891; ASTM F1488; CSA B181.2; CSA B182.2; CSA B182.4

ELECTRICAL UPDATES



ELECTRICAL UPDATES

NEC 2017 TO NEC 2023 WITH STATE AMENDMENTS

- Chapter 1: General
 - Article 100 Definitions
 - Article 110 General Requirements for Electrical Installations
- Chapter 2: Wiring and Protection
 - Article 210 Branch Circuits Not Over 1000 Volts ac, 1500 Volts dc, Nominal
 - Article 215 Feeders
 - Article 220 Branch-Circuit, Feeder, and Service Load Calculations
 - Article 240 Overcurrent Protection
 - Article 245 Overcurrent Protection for Systems Rated Over 1000 Volts ac, 1500 Volts dc
- Chapter 3: Wiring Methods and Materials
 - Article 300 General Requirements for Wiring Methods and Materials
 - Article 312 Cabinets, Cutout Boxes, and Meter Socket Enclosures
 - Article 314 Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; Fittings; and Handhole Enclosure
- Chapter 4: Equipment for General Use
 - Article 404 Switches
 - Article 406 Receptacles, Cord Connectors, and Attachment Plugs (Caps)
 - Article 410 Luminaires, Lampholders, and Lamps
 - Article 411 Low-Voltage Lighting
 - Article 424 Fixed Electric Space-Heating Equipment
 - Article 430 Motors, Motor Circuits, and Controllers
 - Article 440 Air-Conditioning and Refrigerating Equipment
 - Article 445 Generators
- Chapter 5: Special Occupancies
 - Article 500 Hazardous (Classified) Locations, Classes I, II, and III, Divisions 1 and 2.
- Chapter 6: Special Equipment- No Change or Not Significant
 - Article 625 Electric Vehicle Power Transfer System
 - Article 630 Electric Welders
- Chapter 7: Special Conditions
 - Article 700 Emergency Systems
 - Article 722 Cables for Power-Limited Circuits and Fault-Managed Power Circuits
 - Article 724 Class 1 Power-Limited Circuits and Class 1 Power-Limited Remote-Control and Signaling Circuits
 - Article 726 Class 4 Fault-Managed Power Systems
- Chapter 8: Communications Systems
 - Article 800 General Requirements for Communications Systems
- Chapter 9: Tables- Not Reviewed

ELECTRIC UPDATES

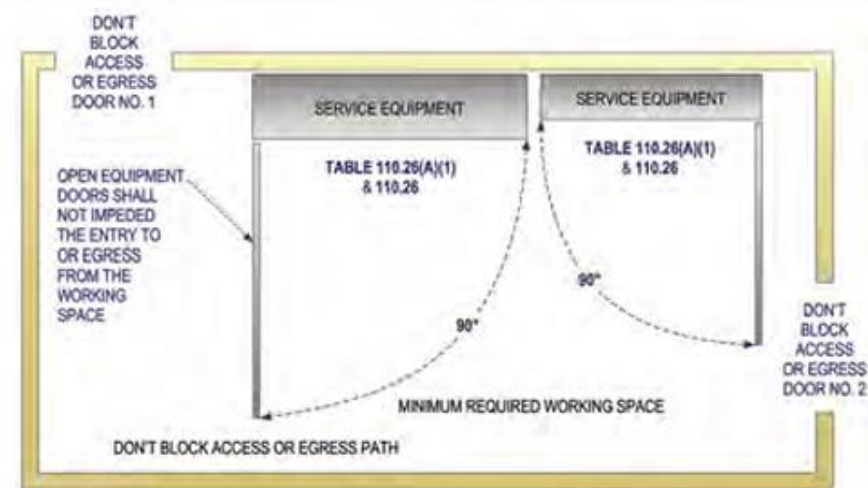
TOPIC: CHAPTER 1 GENERAL

Article 100 Definitions

- All definitions will be located in one location. Previously the definitions were spread throughout the code.

Article 110 General Requirements for Electrical Installations

- 110.26 Spaces About Electrical Equipment
 - **Working space, and access to and egress from working space**, shall be provided and maintained about all electrical equipment to permit ready and safe operation and maintenance of such equipment. **Open equipment doors shall not impede access to and egress from the working space. Access or egress is impeded if one or more simultaneously opened equipment doors restrict working space access to be less than 610 mm (24 in.) wide and 2.0 m (6-1/2 ft) high.**



ELECTRIC UPDATES

TOPIC: CHAPTER 1 GENERAL

Article 110 General Requirements for Electrical Installations

- 110.26 (A)(4) Limited Access
 - (4) The space in front of the enclosure shall comply with the depth requirements of Table 110.26(A)(1) and **shall be unobstructed to the floor by fixed cabinets, walls, or partitions. Space reductions in accordance with 110.26(A)(1)(b) shall be permitted.** The maximum height of the working space shall be the height necessary to install the equipment in the limited space. A horizontal ceiling structural member or access panel shall be permitted in this space **provided the location of weight-bearing structural members does not result in a side reach of more than 6 inches to work within the enclosure.**

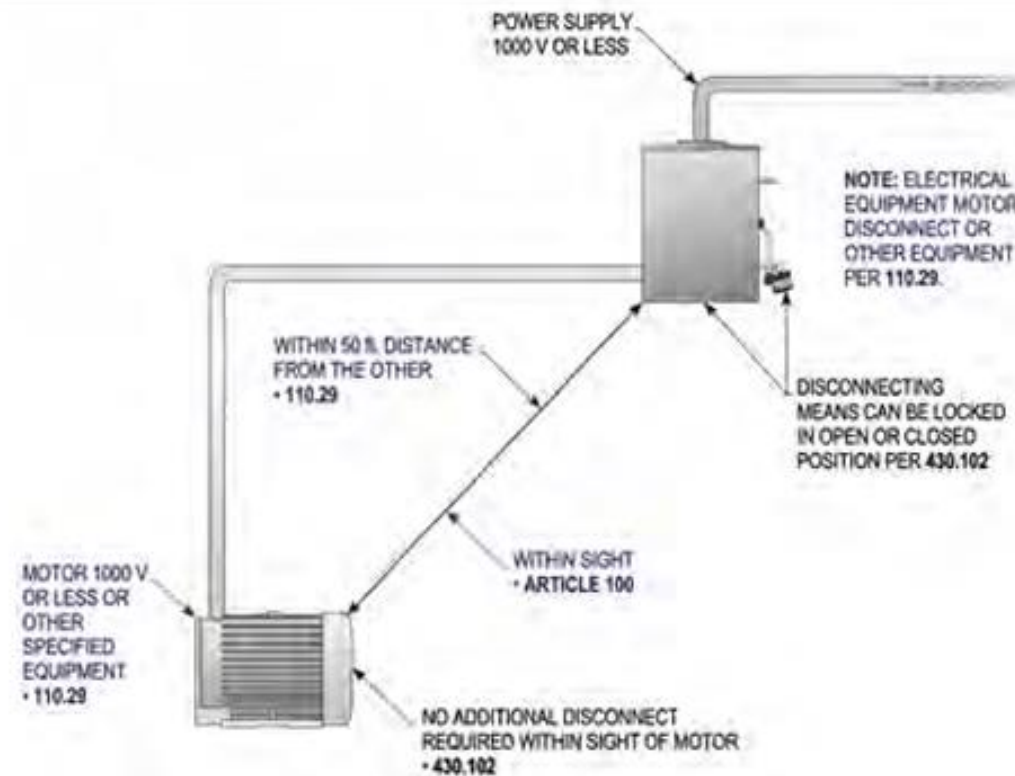


ELECTRIC UPDATES

TOPIC: CHAPTER 1 GENERAL

Article 110 General Requirements for Electrical Installations

- 110.29 In Sight From (Within Sight From, Within Sight)
 - **Where this Code specifies that one equipment shall be “in sight from,” “within sight from,” or “within sight of” another equipment, the specified equipment shall be visible and not more than 15 m (50 ft) distance from the other.**
- **The terms were used throughout the code but it wasn't a requirement.**



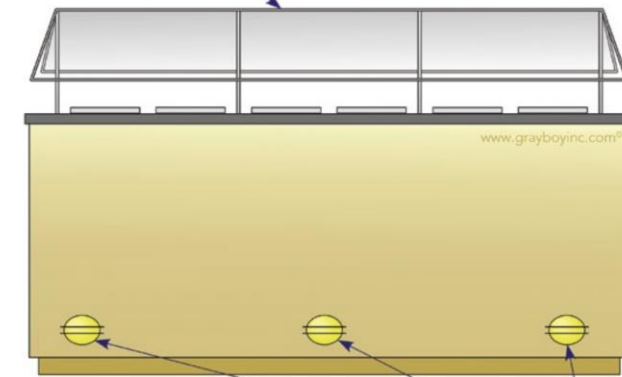
ELECTRIC UPDATES

TOPIC: CHAPTER 2 WIRING AND PROTECTION

Article 210 Branch Circuits Not Over 1000 Volts ac, 1500 Volts dc, Nominal

- 210.8(B) GFCI Protection for Personnel Other Than Dwelling Units
 - **(2) Kitchen**
 - **(3) Areas with sinks** and permanent provisions for food preparation, **beverage preparation**, or cooking
 - **(4) Buffet serving areas** with permanent provisions for food serving, beverage serving, or cooking
 - **(7) Sinks where receptacles or cord-and-plug-connected fixed or stationary appliances** are installed within 1.8 m (6 ft) from the top inside edge of the bowl of the sink.

BUFFET AREA FOR SERVING FOOD PER 210.8(B)(4)



RECEPTACLES WITH GFCI FOR SERVING BUFFET AREAS PER 210.8(B)(4)



ELECTRIC UPDATES

TOPIC: CHAPTER 2 WIRING AND PROTECTION

- 210.8(D) GFCI Protection for Personnel Specific Appliances
 - GFCI protection shall be provided for the branch circuit or outlet supplying the following appliances rated 150 volts or less to ground and 60 amperes or less, single- or 3-phase:
 - (1) Automotive vacuum machines
 - (2) Drinking water coolers and bottle fill stations
 - (3) High-pressure spray washing machines
 - (4) Tire inflation machines
 - (5) Vending machines
 - (6) Sump pumps
 - (7) Dishwashers
 - (8) Electric ranges
 - (9) Wall-mounted ovens
 - (10) Counter-mounted cooking units
 - (11) Clothes dryers
 - (12) Microwave ovens

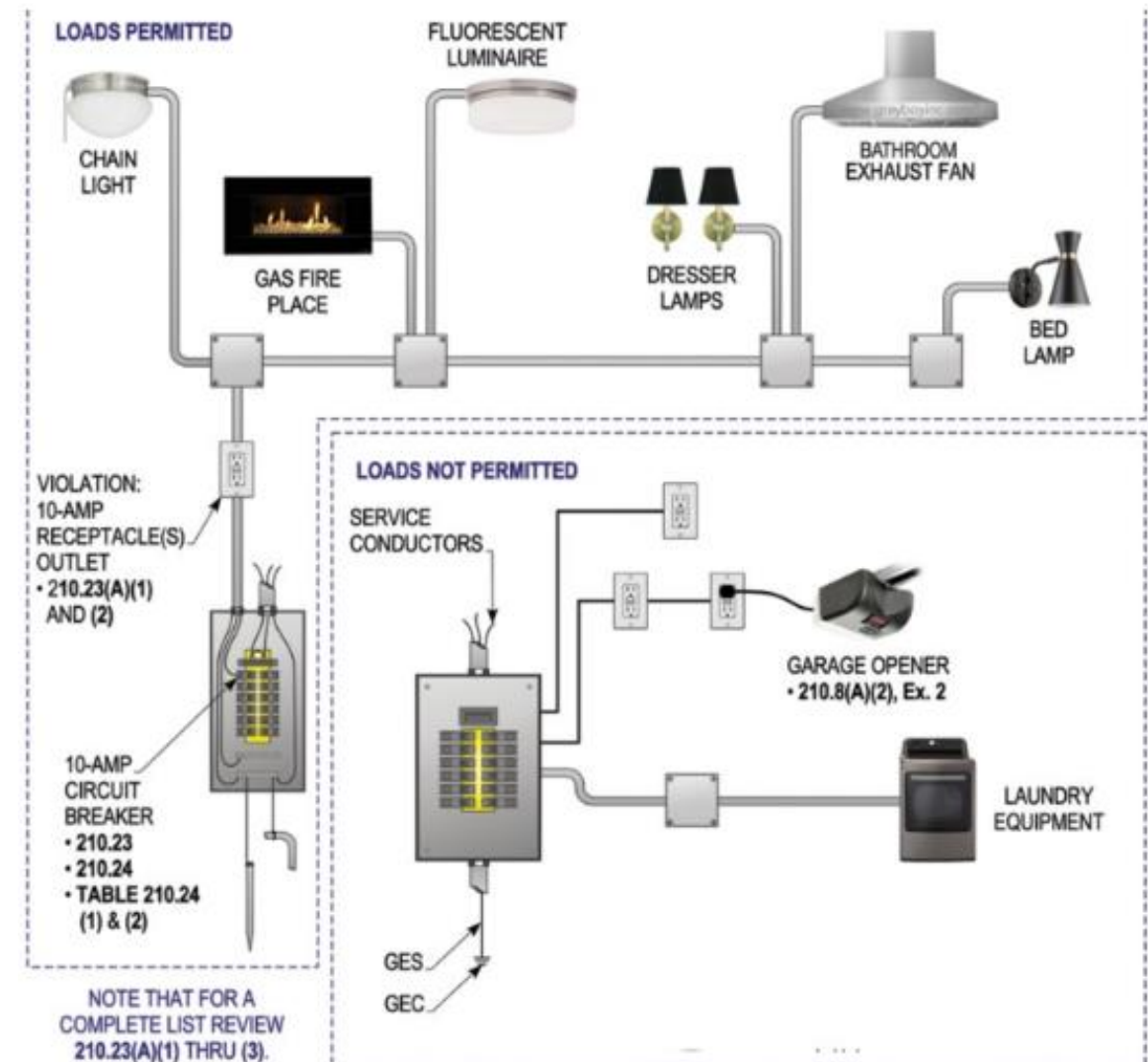


GFCI PROTECTION FOR PERSONNEL (SPECIFIC APPLIANCES)
NEC 210.8(D)(1) THRU (D)(12)

ELECTRIC UPDATES

TOPIC: CHAPTER 2 WIRING AND PROTECTION

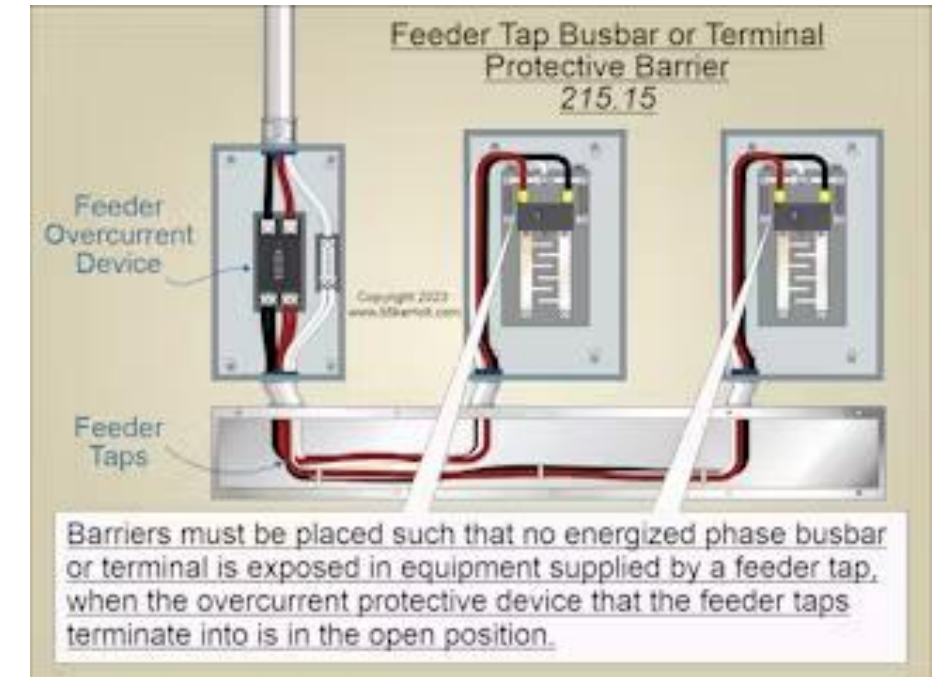
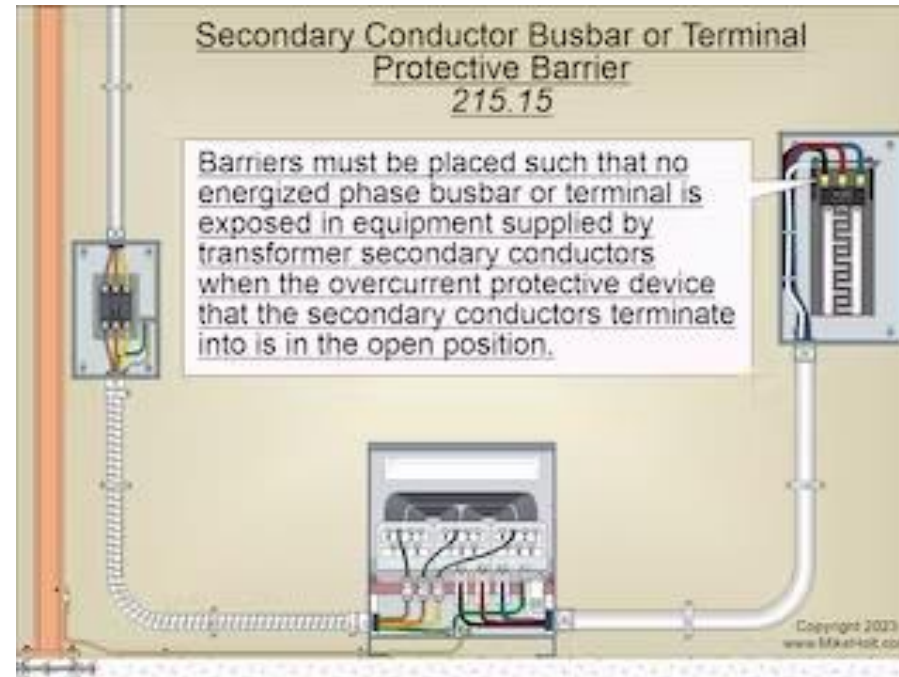
- 210.23 Permissible Loads, Multiple-Outlet Branch Circuits
 - (A) 10-Ampere Branch Circuits. A 10-ampere branch circuit shall comply with the requirements of 210.23(A)(1) and (A)(2).
 - (1) Loads Permitted for 10-Ampere Branch Circuits. A 10-ampere branch circuit shall be permitted to supply one or more of the following:
 - (1) Lighting outlets
 - (2) Dwelling unit exhaust fans on bathroom or laundry room lighting circuits
 - (3) A gas fireplace unit supplied by an individual branch circuit
 - (2) Loads Not Permitted for 10-Ampere Branch Circuits. A 10-ampere branch circuit shall not supply any of the following:
 - (1) Receptacle outlets
 - (2) Fixed appliances, except as permitted for individual branch circuits
 - (3) Garage door openers
 - (4) Laundry equipment



ELECTRIC UPDATES

TOPIC: CHAPTER 2 WIRING AND PROTECTION

- Article 215.15 Barriers. Barriers shall be placed such that no energized uninsulated, ungrounded busbar or terminal is exposed to inadvertent contact by persons or maintenance equipment while servicing load terminations in panelboards, switchboards, switchgear, or motor control centers supplied by feeder taps in 240.21(B) or transformer secondary conductors in 240.21(C) when the disconnecting device, to which the tap conductors are terminated, is in the open position.



ELECTRIC UPDATES

TOPIC: CHAPTER 2 WIRING AND PROTECTION

- **Articles: *215.18 Feeders; *225.42 Outside Branch Circuits and Feeders; *230.67 Services; Surge Protection.**
- **(A) Surge-Protective Device. Where a feeder and all services supplies any of the following, a surge-protective device (SPD) shall be installed:**
 - (1) Dwelling units
 - (2) Dormitory units
 - (3) Guest rooms and guest suites of hotels and motels
 - (4) Areas of nursing homes and limited-care facilities used exclusively as patient sleeping rooms
- **(B) Location. The SPD shall be installed in or adjacent to distribution and service equipment, connected to the load side of the feeder, that contains branch circuit overcurrent protective device(s) that supply the location specified in 215.18(A), 225.42(A) and 230.67(A). Informational Note: Surge protection is most effective when closest to the branch circuit. Surges can be generated from multiple sources including, but not limited to, lightning, the electric utility, or utilization equipment.**
- **(C) Type. The SPD shall be a Type 1 or Type 2 SPD.**
- **(D) Replacement. Where the distribution equipment supplied by the feeder is replaced, all of the requirements of this section shall apply.**
- **(E) Ratings. SPDs shall have a nominal discharge current rating (In) of not less than 10 kA.**

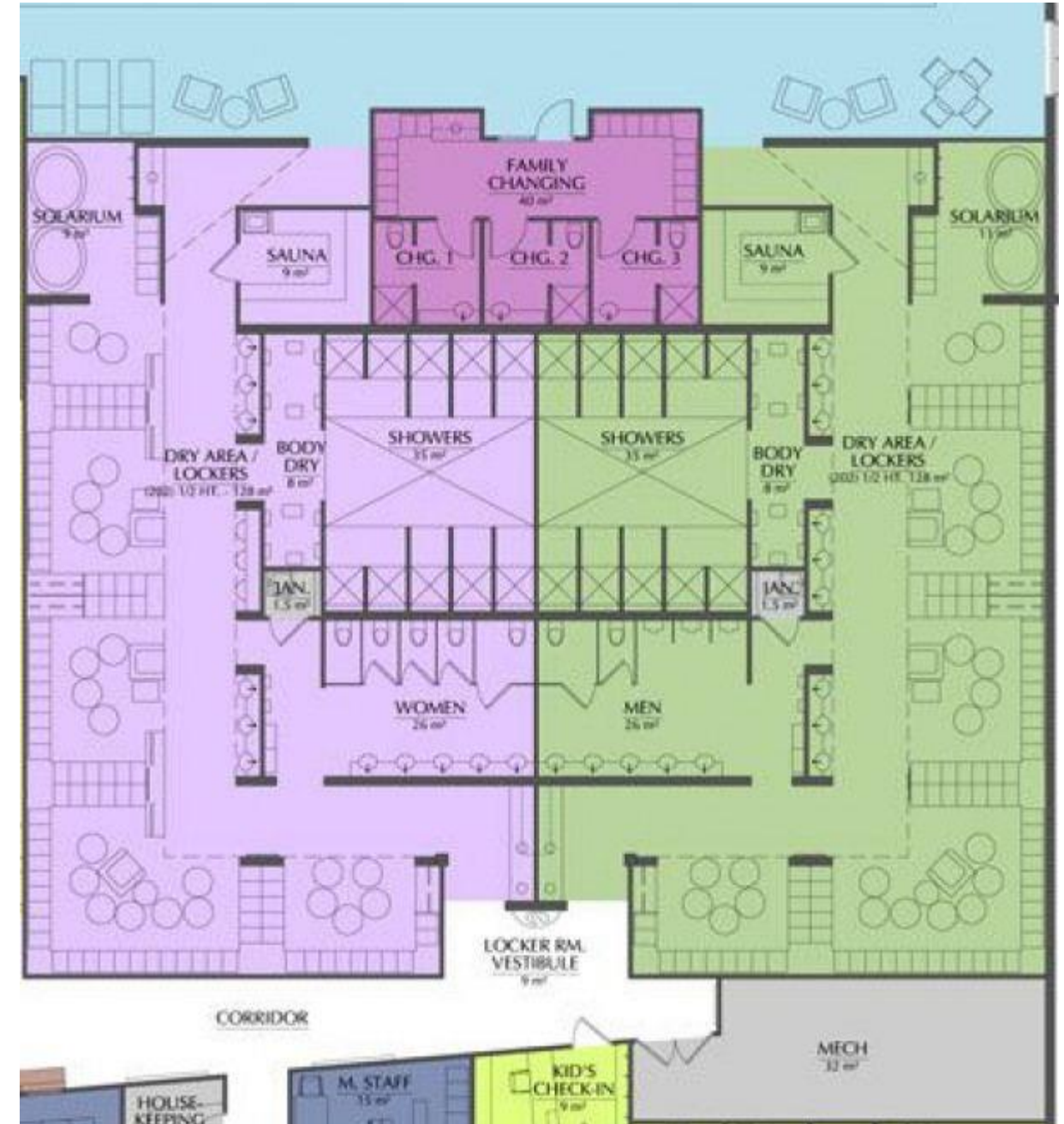
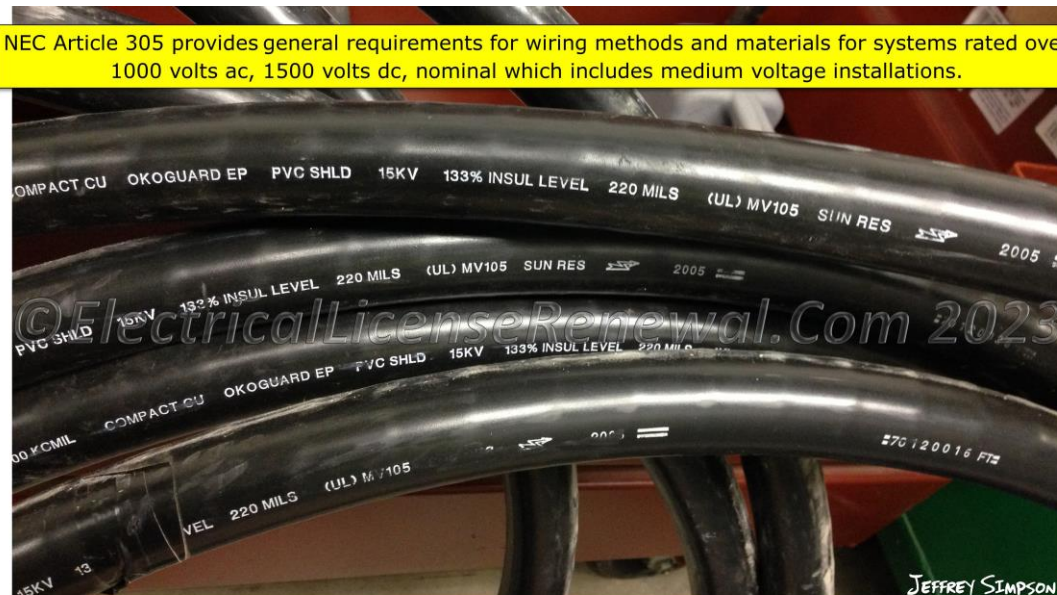


ELECTRIC UPDATES

TOPIC: CHAPTER 2 WIRING AND PROTECTION

- Article 240.24 Location in or on Premises.
 - (E) Not Located in Bathrooms. **Overcurrent protective devices, other than supplementary overcurrent protection shall not be located in bathrooms, showering facilities, or locker rooms with showering facilities.**
- Article 245 Overcurrent Protection for Systems Rated Over 1000 Volts ac, 1500 Volts dc.
 - (Increased voltages to include newer dc photovoltaic systems, this is also covered in Article 305).

NEC Article 305 provides general requirements for wiring methods and materials for systems rated over 1000 volts ac, 1500 volts dc, nominal which includes medium voltage installations.

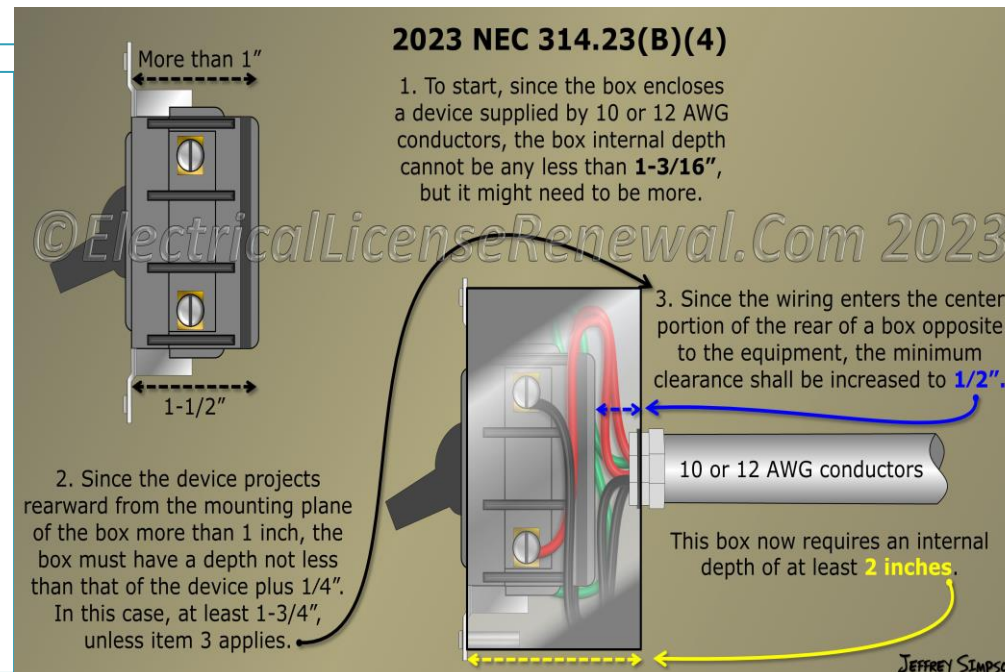


ELECTRIC UPDATES

TOPIC: CHAPTER 3 WIRING METHODS AND MATERIALS

- 300.4 Protection Against Physical Damage
 - (G) Fittings. Where raceways contain 4 AWG or larger insulated circuit conductors, and these conductors enter a cabinet, a box, an enclosure, or a raceway, **prior to the installation of conductors, the conductors shall be protected** in accordance with any of the following:
- Article 312 Cabinets, Cutout Boxes, and Meter Socket Enclosures
- **312.10 Screws or Other Fasteners.** Screws or other fasteners installed in the field that enter wiring spaces shall be as provided by or specified by the manufacturer or shall comply with the following as applicable:
 - (1) Screws shall be machine type with blunt ends
 - (2) Other fasteners shall have blunt ends
 - (3) Screws or other fasteners shall extend into the enclosure no more than 6mm (1/4 in.) unless the end is protected with approved means.

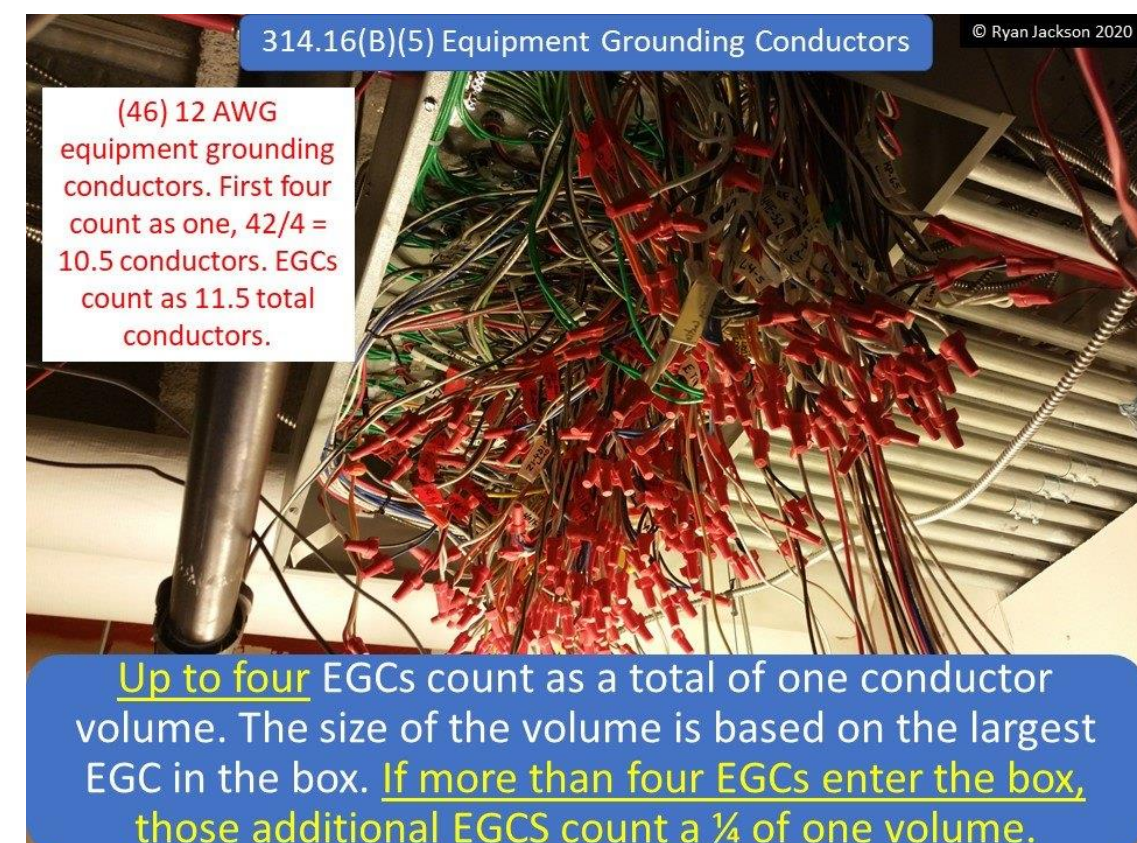
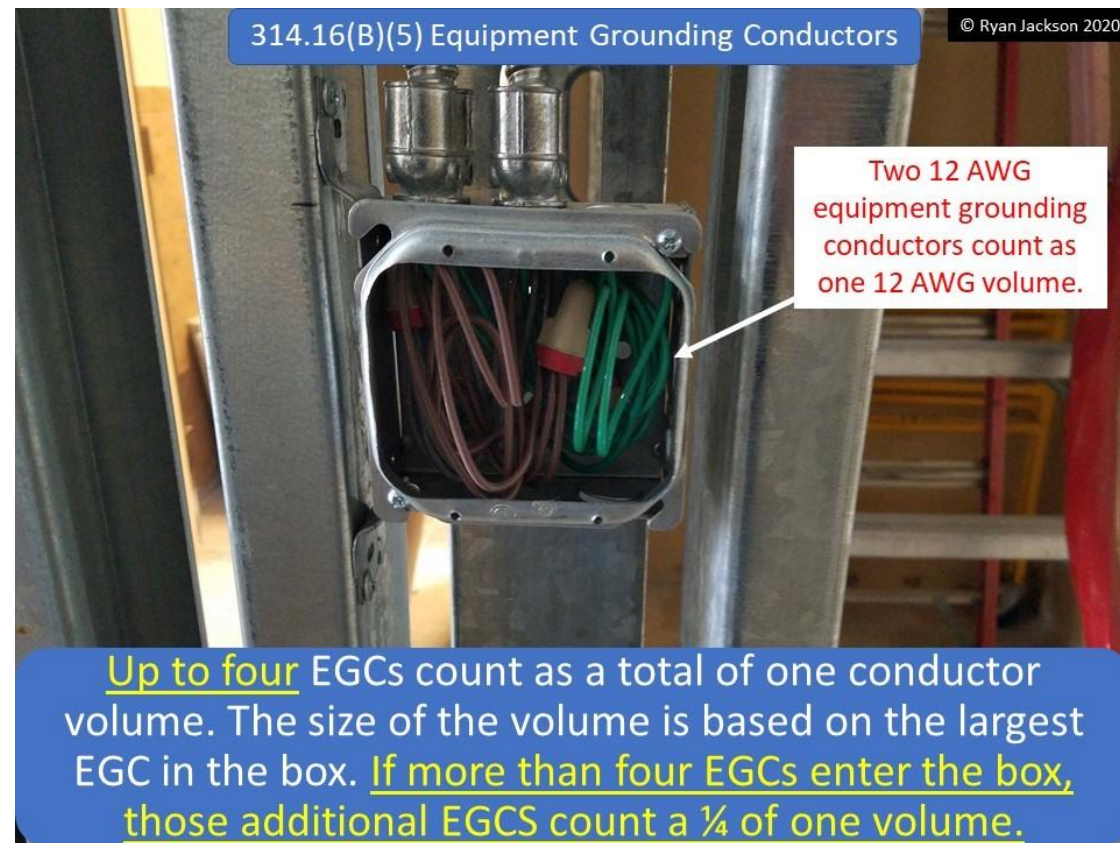
- Article 314 Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; Fittings; and Handhole Enclosures.
 - **314.5 Screws or Other Fasteners.** (similar to 312.10)
 - **314.24(B)(4) Conductors 12 or 10 AWG.** Where wiring enters the center portion of the rear of a box opposite to the equipment, minimum clearances shall be increased to (1/2 in.)



ELECTRIC UPDATES

TOPIC: CHAPTER 3 WIRING METHODS AND MATERIALS

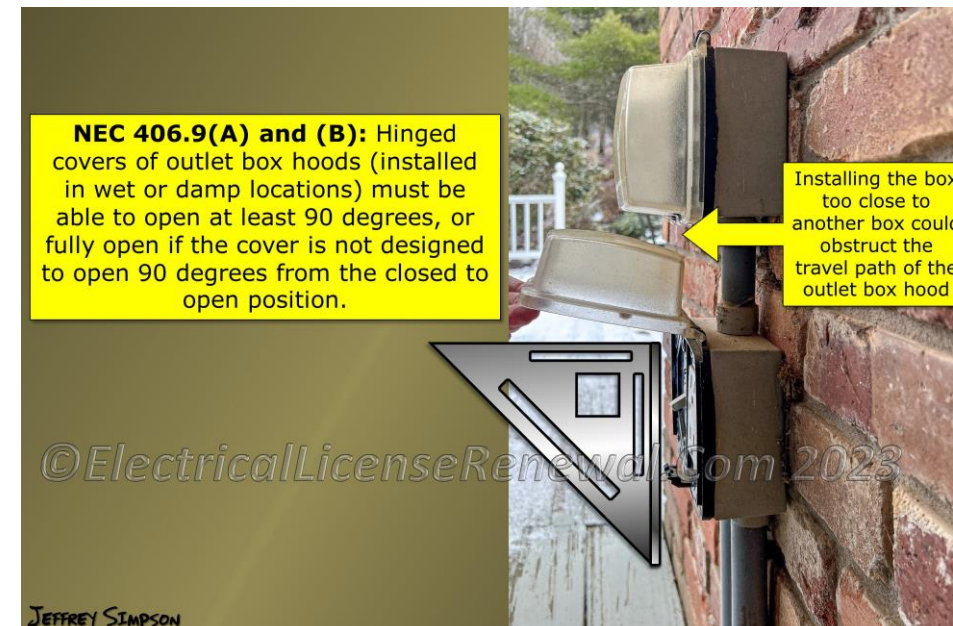
- 314.16 (B)(5) Equipment Grounding Conductor Fill.
 - Where **up to four** equipment grounding conductors or equipment bonding jumpers enter a box, a single volume allowance in accordance with Table 314.16(B) shall be made based on the largest equipment grounding conductor or equipment bonding jumper **entering** the box. **A ¼ volume allowance shall be made for each additional equipment grounding conductor or equipment bonding jumper that enters the box, based on the largest equipment grounding conductor entering the box.**



ELECTRIC UPDATES

TOPIC: CHAPTER 4 EQUIPMENT FOR GENERAL USE

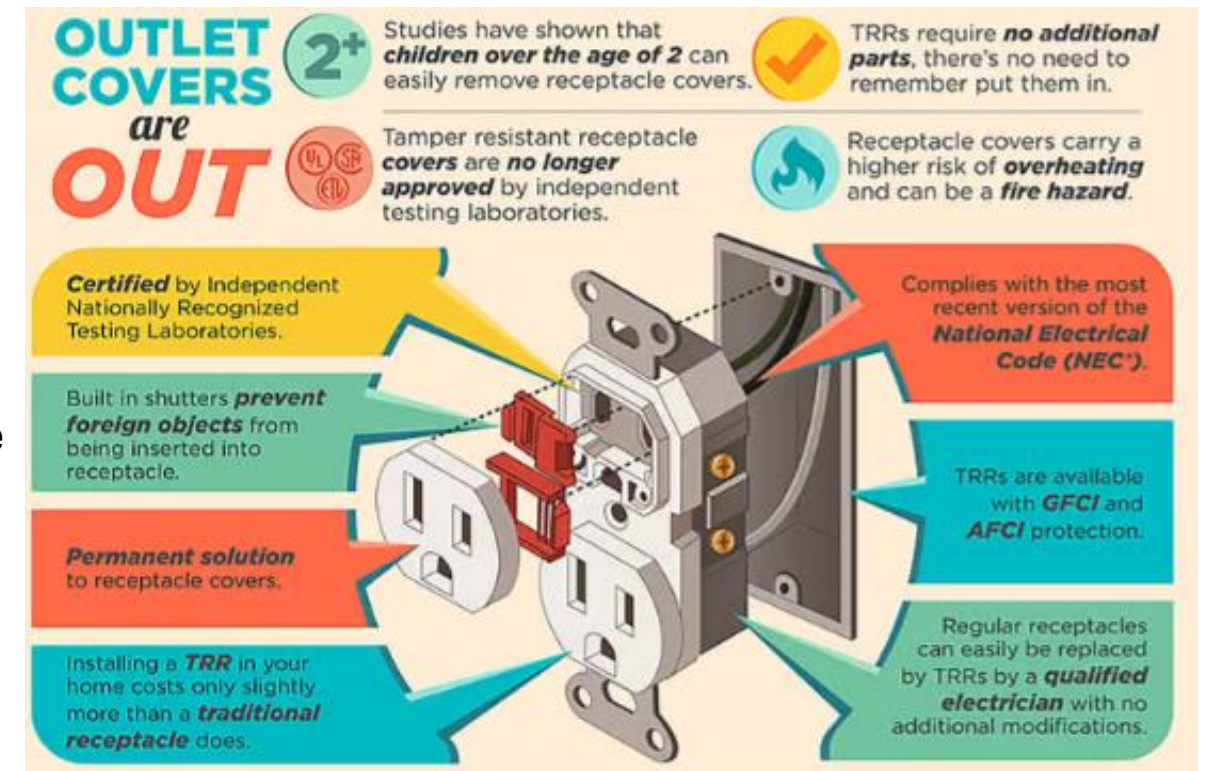
- 406.9 Receptacles in Damp or Wet Locations.
 - (A) Damp Locations.
 - **“Hinged covers of outlet box hoods shall be able to open at least 90 degrees, or fully open if the cover is not designed to open 90 degrees from the closed to open position, after installation.”**
 - (B) Wet Locations.
 - (1) Receptacles of 15 Amperes and 20 Amperes in a Wet Location.
 - **“Hinged covers of outlet box hoods shall be able to open at least 90 degrees, or fully open if the cover is not designed to open 90 degrees from the closed to open position, after installation.”**
 - *This means that the cover door cannot be blocked. This could be an issue for retrofits at existing building locations that have changed uses.*



ELECTRIC UPDATES

TOPIC: CHAPTER 4 EQUIPMENT FOR GENERAL USE

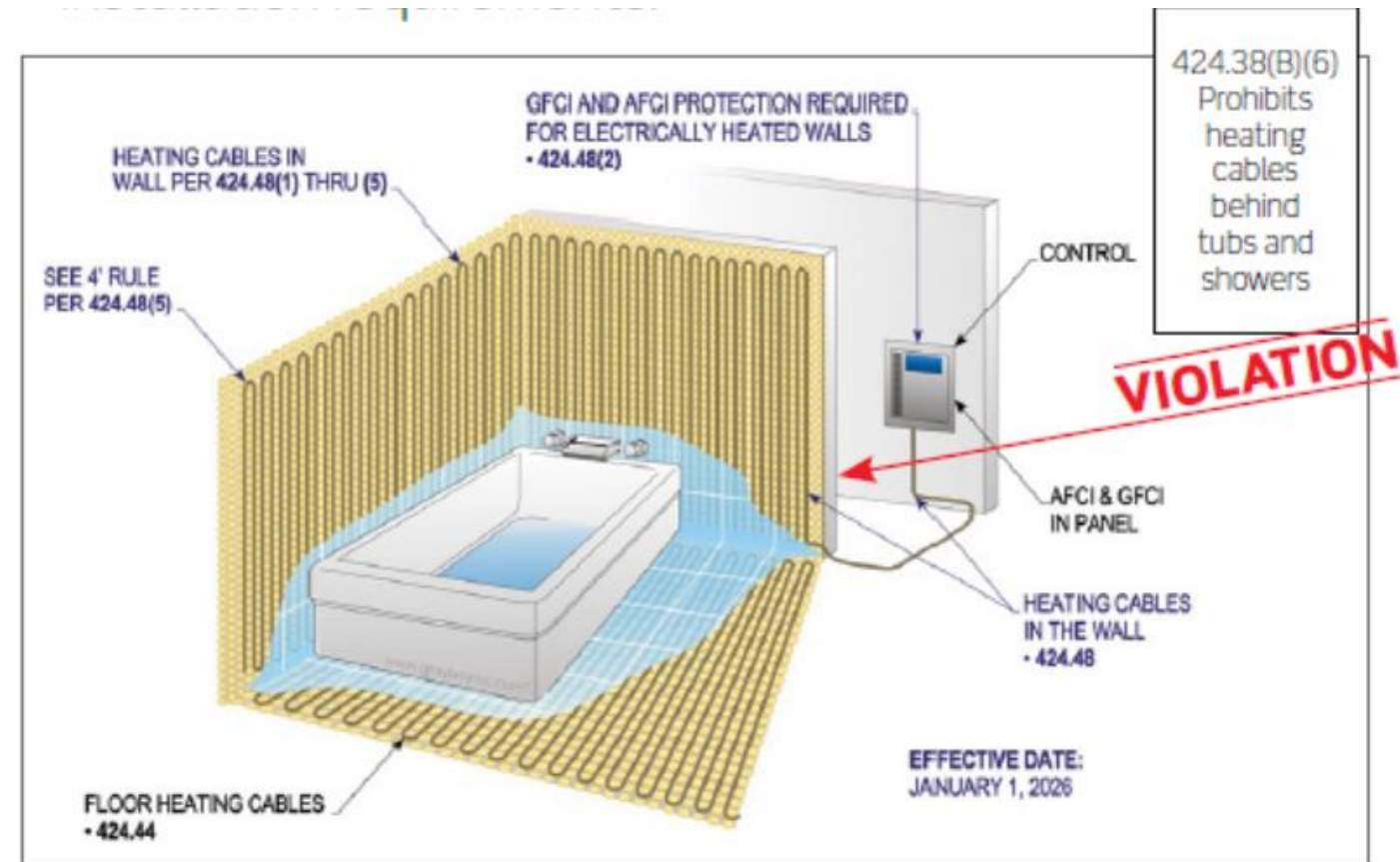
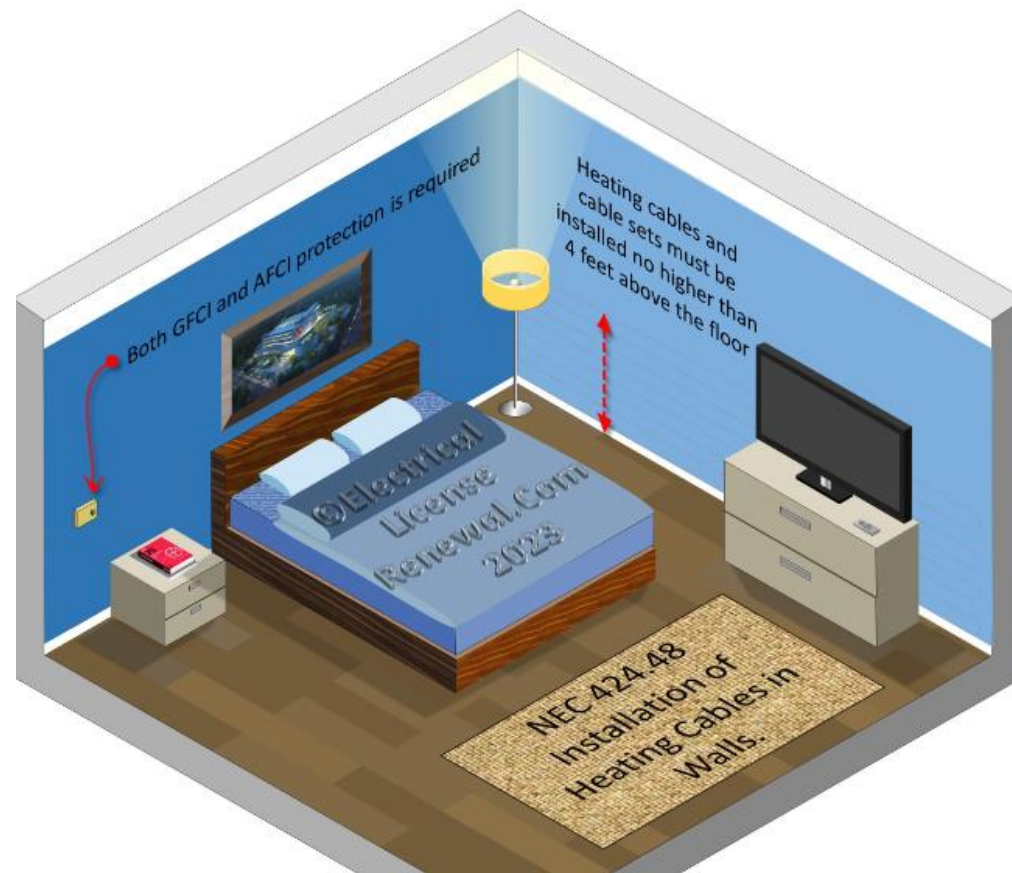
- 406.12 Tamper-Resistant Receptacles. All 15- and 20-ampere, 125- and 250-volt nonlocking-type receptacles in the following locations shall be listed tamper-resistant receptacles:
 - (1) All dwelling units, boathouses, mobile homes and manufactured homes, including their attached and detached garages, accessory buildings, and common areas
 - (2) Guest rooms and guest suites of hotels, motels, and their common areas
 - (3) Childcare facilities
 - (4) Preschools and education facilities
 - (5) Within clinics, medical and dental offices, and outpatient facilities, the following spaces:
 - a. Business offices accessible to the general public
 - b. Lobbies and waiting spaces
 - c. Spaces of nursing homes and limited care facilities covered in 517.10(B)(2)
 - (6) Places of awaiting transportation, gymnasiums, skating rinks, fitness centers, and auditoriums
 - (7) Dormitory units
 - (8) Residential care/assisted living facilities, social and substance abuse rehabilitation facilities, and group homes
 - (9) Foster care facilities, nursing homes, and psychiatric hospitals
 - (10) Areas of agricultural buildings accessible to the general public and any common areas



ELECTRIC UPDATES

TOPIC: CHAPTER 4 EQUIPMENT FOR GENERAL USE

- Article 424.48 Installation of Cables in Walls.
 - Unless prohibited by 424.38(B), heating cables and cable sets shall be permitted to be installed in, on, or behind walls provided all of the following are met:
 - Doesn't go into effect until January 1, 2026

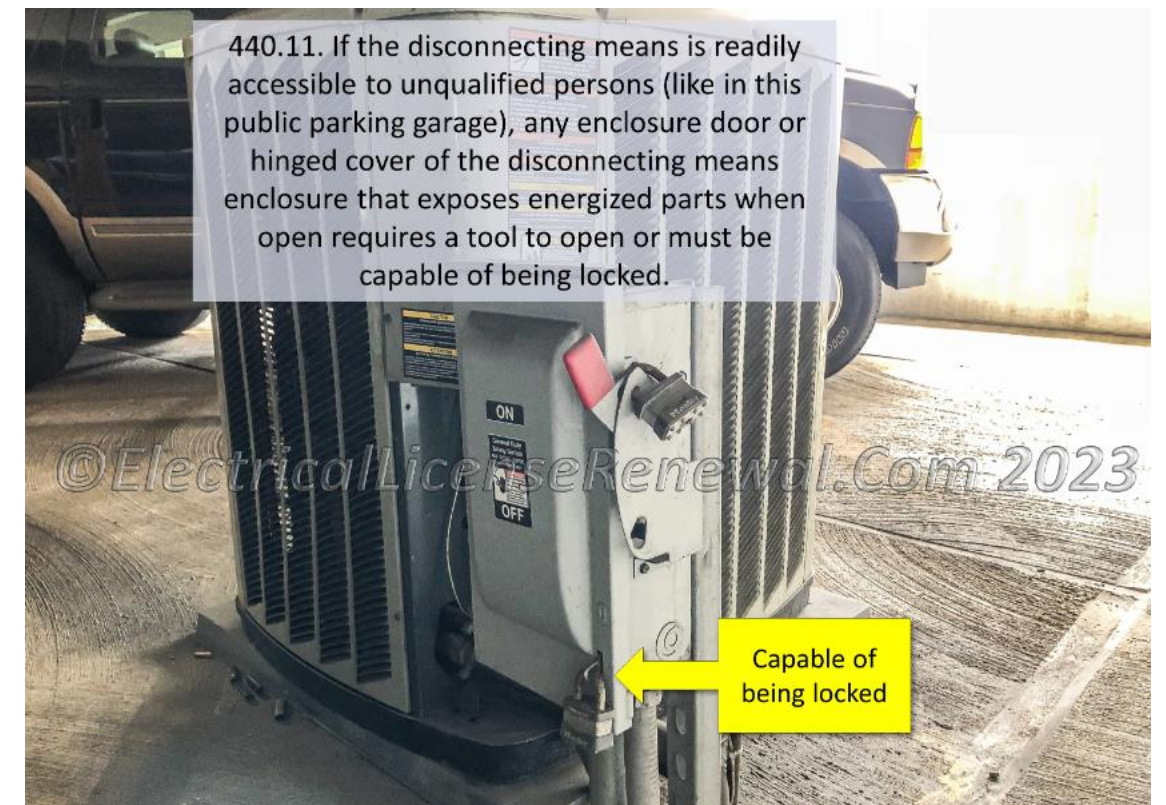


ELECTRIC UPDATES

TOPIC: CHAPTER 4 EQUIPMENT FOR GENERAL USE

- Article 440.11 General. **Disconnecting means shall be capable of disconnecting air-conditioning and refrigerating equipment, including motor-compressors and controllers, from the circuit conductors. If the disconnecting means is readily accessible to unqualified persons, any enclosure door or hinged cover of a disconnecting means enclosure that exposes energized parts when open shall require a tool to open or be capable of being locked.**
- 440.14 Location. Disconnecting means shall be located within sight from, and readily accessible from, the air-conditioning or refrigerating equipment. The disconnecting means shall be permitted to be installed on or within the air-conditioning or refrigerating equipment. **Disconnecting means shall meet the working space requirements of 110.26(A).**

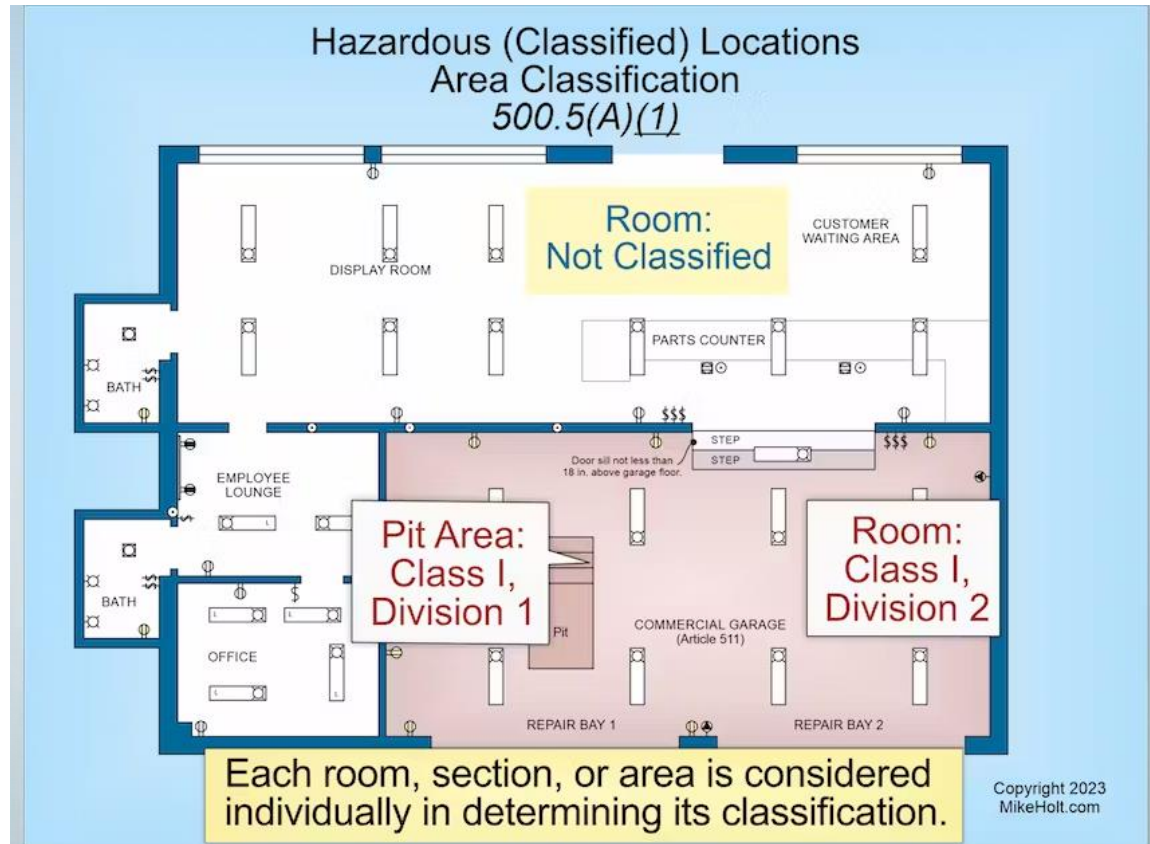
I didn't think this was an issue but it must happen enough that they added it to the code.



ELECTRIC UPDATES

TOPIC: CHAPTER 5 SPECIAL OCCUPANCIES

- Article 500.4 Documentation.
 - **Areas** designated as hazardous (classified) locations or determined to be unclassified shall be documented on an area classification drawing and other associated documentation. This documentation shall be available to the authority having jurisdiction (AHJ) and those authorized to design, install, inspect, maintain, or operate electrical equipment at the location.



ELECTRIC UPDATES

TOPIC: CHAPTER 6 SPECIAL EQUIPMENT

- Article 625.40 Electric Vehicle Branch Circuit. Each outlet installed for the purpose of **supplying EVSE greater than 16 amperes or 120 volts** shall be supplied by an individual branch circuit.
- Article 625.42 Rating. The **EVSE** shall have sufficient rating to supply the load served. Electric vehicle charging loads shall be considered to be continuous loads for the purposes of this article. Service and feeder shall be sized in accordance with the product ratings, **unless the overall rating of the installation can be limited through controls as permitted by 625.42 (A) or (B).**
 - **(A) Energy Management System (EMS).** Where an EMS in accordance with 750.30 provides load management of EVSE, the maximum equipment load on a service and feeder shall be the maximum load permitted by the EMS. The EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an internal load management control, the system shall be marked to indicate this control is provided.
 - **(B) EVSE with Adjustable Settings.** EVSE with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer's instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. EVSE as referenced shall be permitted to have ampere ratings that are equal to the adjusted current settings.
- Article 625.43 Disconnecting Means. For **EVSE and WPTE** rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. **If the disconnecting means is installed remote from the equipment, a plaque shall be installed on the equipment denoting the location of the disconnecting means.** The disconnecting means shall be lockable open in accordance with 110.25
- **625.49 Island Mode.** EVPE and bidirectional EVSE that incorporate a power export function shall be permitted to be part of an interconnected power system operating in island mode.

ELECTRIC UPDATES

TOPIC: CHAPTER 6 SPECIAL EQUIPMENT

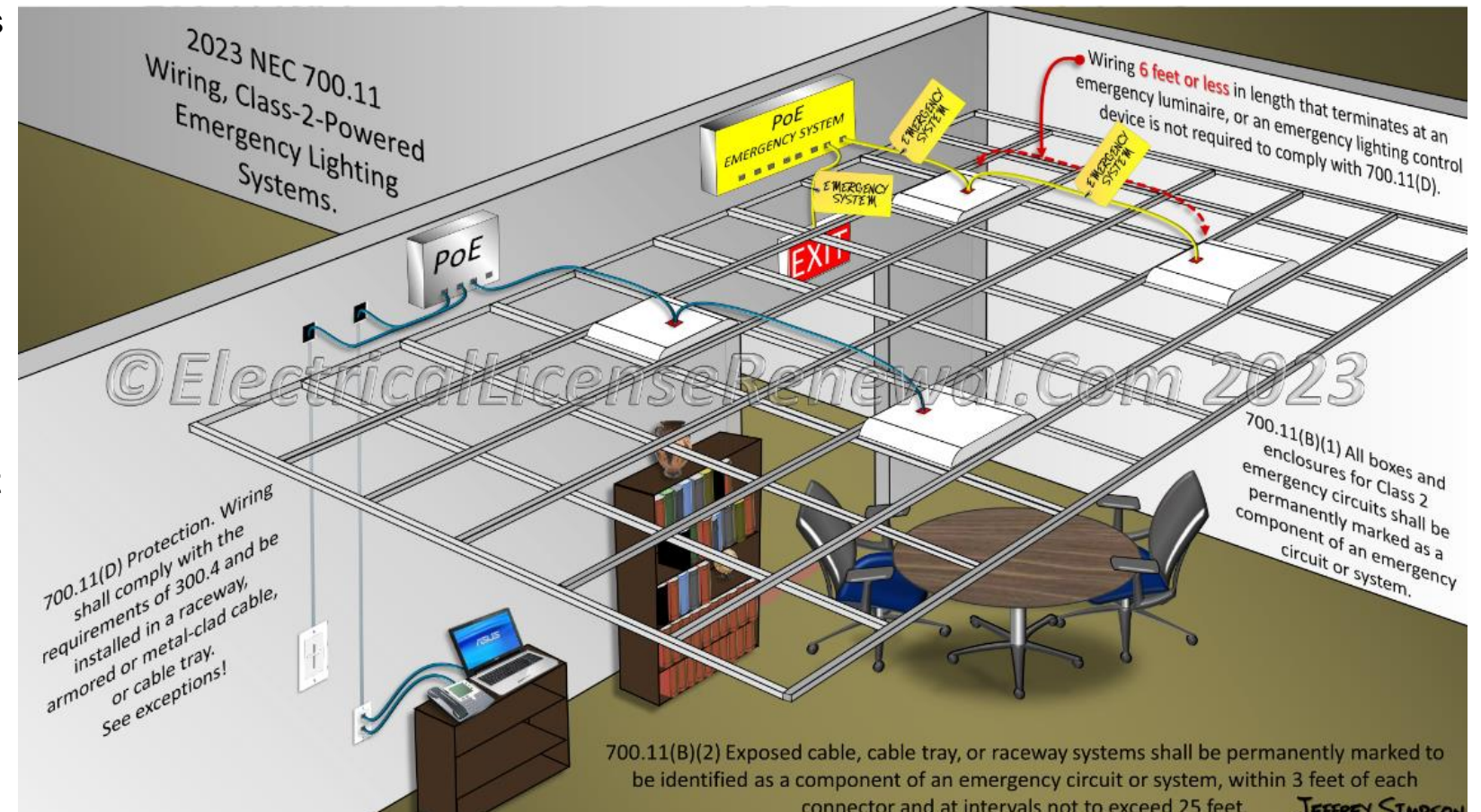
- **Article 630.8 Ground-Fault Circuit-Interrupter Protection for Personnel.** All 125-volt, 15- and 20-ampere receptacles for electrical hand tools or portable lighting equipment, supplied by single-phase branch circuits rated 150 volts or less to ground, installed in work areas where welders are operated shall have ground-fault circuit-interrupter protection for personnel.
- * This is for all areas where welding is typically done, this may not effect design of new buildings but where maintenance zones are located or revised this will need to be accounted for.
- If a welding receptacle is installed then the 120V receptacles in the area should be GFCI Protected.



ELECTRIC UPDATES

TOPIC: CHAPTER 7 SPECIAL EQUIPMENT

- Article 700.11 Wiring, Class-2-Powered Emergency Lighting Systems.
 - (A) General. Line voltage supply wiring and installation of Class 2 emergency lighting control devices shall comply with 700.10. Class 2 emergency circuits shall comply with 700.11(B) through (D).
 - (B) Identification. Emergency circuits shall be permanently marked so they will be readily identified as a component of an emergency circuit or system by the following methods:
 - (1) All boxes and enclosures for Class 2 emergency circuits shall be permanently marked as a component of an emergency circuit or system.
 - (2) Exposed cable, cable tray, or raceways systems shall be permanently marked to be identified as a component of an emergency circuit or system, within 900 mm (3 ft) of each connector and at intervals not to exceed 7.6 m (25 ft).
 - (C) Separation of Circuits. Class 2 emergency circuits shall be wired in a listed, jacketed cable or with one of the wiring methods of Chapter 3. If installed alongside nonemergency Class 2 circuits that are bundled, Class 2 emergency circuits shall be bundled separately. If installed alongside nonemergency Class 2 circuits that are not bundled, Class 2 emergency circuits shall be separated by a nonconductive sleeve or nonconductive barrier from all other Class 2 circuits. Separation from other circuits shall comply with 725.136.
 - (D) Protection. Wiring shall comply with the requirements of 300.4 and be installed in a raceway, armored or metal-clad cable, or cable tray.



ELECTRIC UPDATES

TOPIC: CHAPTER 7 SPECIAL EQUIPMENT

- 722 Cables for Power-Limited Circuits and Fault-Managed Power Circuits
- 724 Class 1 Power-Limited Circuits and Remote Control & Signaling Circuits
- 726 Class 4 Fault Managed Power Systems

“Completely new to deal with more POE systems and the use of low voltage wiring.”

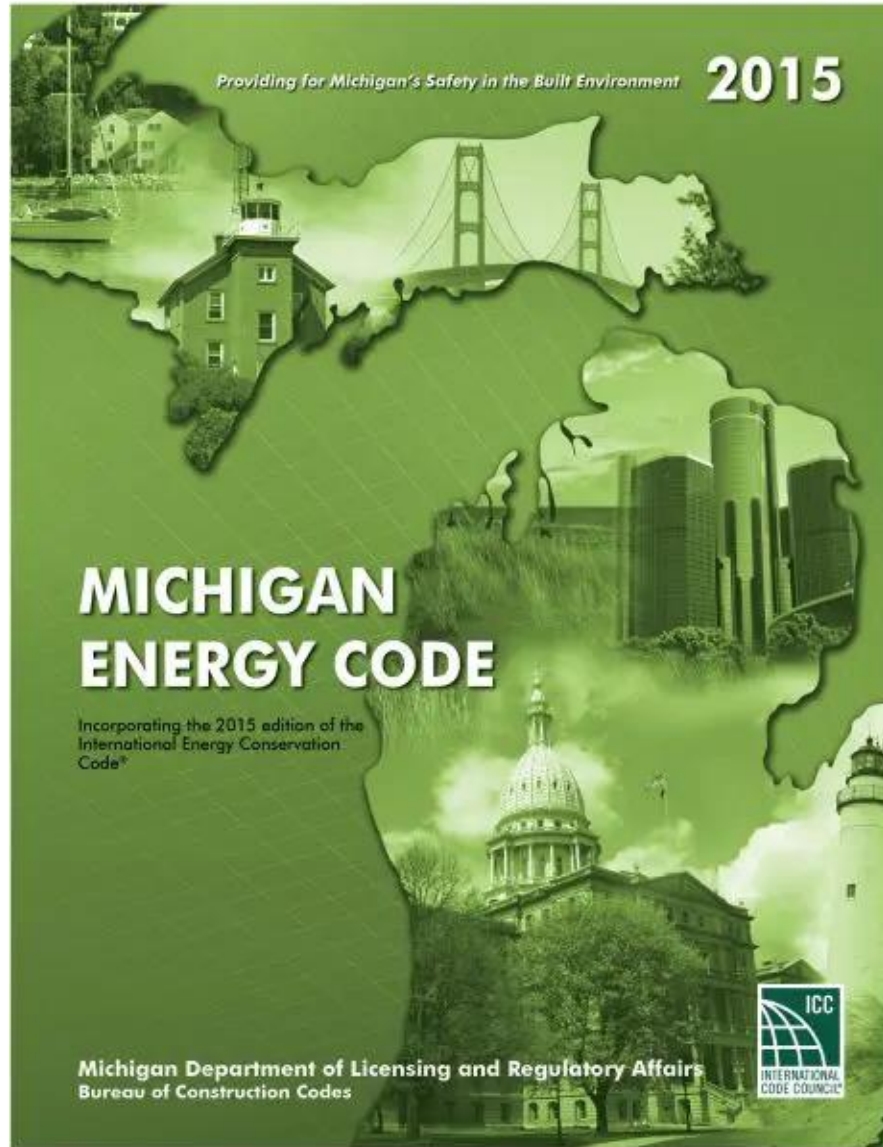


ELECTRIC UPDATES

TOPIC: CHAPTER 8 COMMUNICATIONS SYSTEMS

- **Article 800 General Requirements for Communications Systems** **This was added in 2020 NEC. This section was added to combine redundant requirements into one location.**
- **Article 800.3 Other Articles.**
 - **(G) Vertical Support for Fire-Resistive Cables and Conductors.** Vertical installations of circuit integrity (CI) cables and conductors installed in a raceway or conductors and cables of fire-resistive cable systems shall be installed in accordance with 300.19
 - **(H) Bonding and Grounding of Cable Shields.** The requirements of 250.4(A)(5) shall apply to the metal shields of cables used for communications.
- **Article 800.133**
 - **(A) In Raceways, Cable Trays, Boxes, Cables, Enclosures, and Cable Routing Assemblies.**
 - **(2) Class 2 and Class 3 Circuits**
 - **(3) Electric Light, Power, Class 1, Non-Power-Limited Fire Alarm, and Medium-Power Network-Powered Broadband Communications Circuits in Raceways, Compartments, and Boxes.**
 - **(B) Other Applications.**
These sections all discuss separation requirements of the cabling in the building.

ENERGY CODE UPDATES



ANSI/ASHRAE/IES Standard 90.1-2019
(Supersedes ANSI/ASHRAE/IES Standard 90.1-2016)
Includes ANSI/ASHRAE/IES addenda listed in Appendix I

Energy Standard for Buildings Except Low-Rise Residential Buildings (I-P Edition)

See Appendix I for approval dates by ASHRAE, the Illuminating Engineering Society, and the American National Standards Institute.

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. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

© 2019 ASHRAE

ISSN 1041-2336



ENERGY CODE UPDATES

EFFECTIVE APRIL 22, 2025

PART 10a. MICHIGAN ENERGY CODE

R 408.31087 Applicable code.

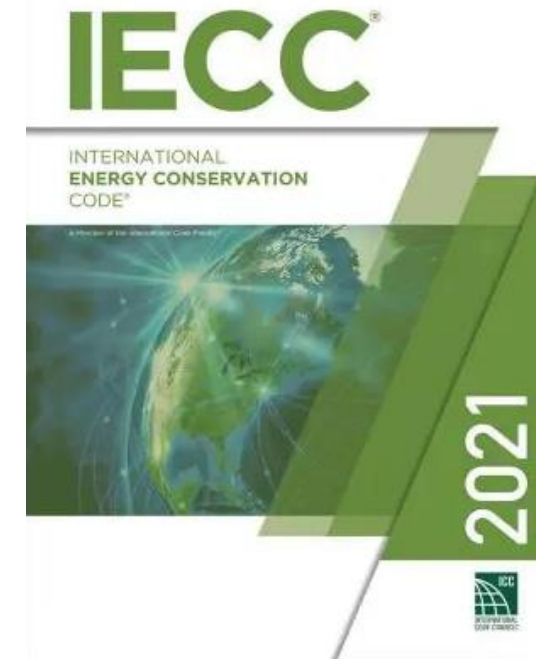
Rule 1087. Rules governing the energy efficiency for the design and construction of buildings and structures, not including residential buildings, shall be those contained in the international energy conservation code, 2021 edition except for sections C104.2 to C104.5, C109.1 to C109.4, C110.1 to C110.3, and appendix CA and the ASHRAE energy standard for buildings, except low-rise residential buildings ANSI/ASHRAE/IESNA standard 90.1-2019, referred to as the standard in these rules, including appendices A, C, E, F, G, H, and I. With the amendments noted, the international energy conservation code and the standard are adopted by reference in these rules. The provisions contained in Appendix CB are specifically adopted and authorized as mandatory requirements. The provisions contained in Appendix CC are specifically adopted and authorized as permissive guidelines and shall not be mandated by an enforcing agency. The

ENERGY CODE UPDATES

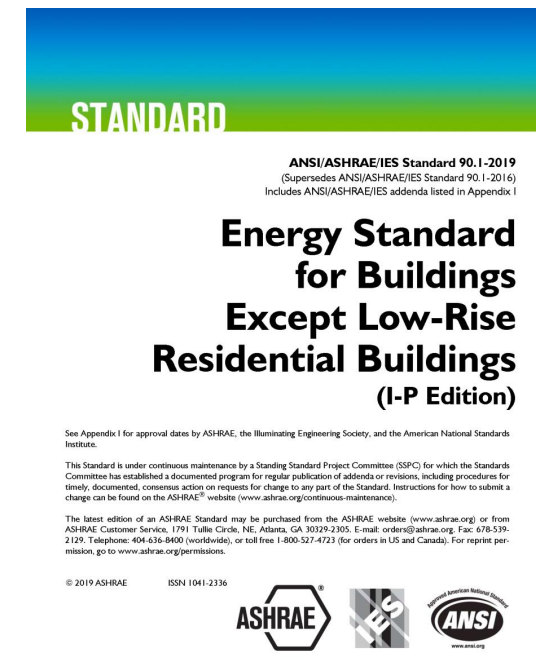
“MICHIGAN COMMERCIAL ENERGY CODE”

- **2021 International Energy Conservation Code** is the model code
 - **ASHRAE 90.1-2019** is a referenced voluntary standard
 - Compliance with **either set of requirements** will meet the new energy code

Prescriptive Performance, Energy Model, or Performance Index



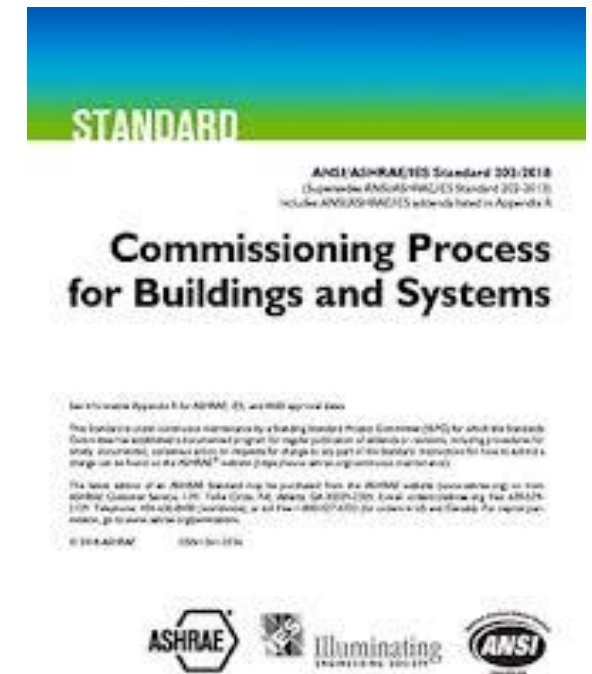
-OR-



ENERGY CODE UPDATES

QUICK POINTS FOR MECHANICAL/ARCHITECTURAL UPDATES TO ASHRAE 90.1-2019

- Many “best practices” and LEED requirements are now required
- More efficient Rooftop Units
- Enhanced Commissioning Requirements
 - ASHRAE Standard 202
 - Whole Building Pressurization testing
- Enhanced Fenestration (Window U-values)
- Tighter construction (lower leakage rates)
- More efficient equipment – Part Load Metrics
- Hydronic cooling – 15 F delta-T
- Fan Efficiency Index (FEI)
- Pump Energy Index (PEI)



ENERGY CODE UPDATES

QUICK POINTS FOR ELECTRICAL UPDATES TO ASHRAE 90.1-2019

- **8.4.2 Automatic Receptacle Control**
 - 50% of all receptacles in private offices, conference rooms, printing/copying rooms, break rooms, classrooms, and individual workstations are now required. This is no longer excluded.
- **8.4.3 Electrical Energy Monitoring**
 - Requires metering of the electrical system broken into the following separate groups.
 - Total electrical energy
 - HVAC systems
 - Interior lighting
 - Exterior lighting
 - Receptacle circuits
- **IECC 2021 - Appendix CB: Solar-ready Zone – Commercial Provisions - THIS IS MANDATORY**
 - Requires 40% of the roof area to be solar ready and labeled on the plans.
 - Space in the building for the solar equipment
 - Pathways from the solar panels to the equipment in the building.
 - Structural needs to be upgraded to support the solar panels on the roof.
 - There are some exceptions to this requirement.

THANK YOU!

QUESTIONS?