Appendix A- 2024 International Energy Conservation Code

Adding Uniform Code to various sections:

C201.3 Terms defined in other codes. Terms that are not defined in this code but are defined in the International Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, Uniform Mechanical Code, International Plumbing Code, **Uniform Plumbing Code**, or the International Residential Code shall have the meanings ascribed to them in those codes.

C403.2.2 Ventilation. Ventilation, either natural or mechanical, shall be provided in accordance with Chapter 4 of the *International Mechanical Code* **or Uniform Mechanical Code**. Where mechanical ventilation is provided, the system shall provide the capability to reduce the outdoor air supply to the minimum required by Chapter 4 of the *International Mechanical Code* or **Uniform Mechanical Code**.

C403.6.1 Variable air volume and multiple-zone systems. Supply air systems serving multiple zones shall be variable air volume (VAV) systems that have zone controls configured to reduce the volume of air that is reheated, re-cooled or mixed in each zone to one of the following:
1. Thirty percent of the zone design peak supply for systems with DDC.
2. Systems with DDC where all of the following apply: 2.1 The airflow rate in the deadband between heating and cooling does not exceed the highest of the allowed rates under items 3, 4, 5, or six of this section.
    2.2 The first stage of heating modulates the zone supply air temperature setpoint up to a maximum setpoint while the airflow is maintained at the deadband flow rate.
    2.3 The second stage of heating modulates the airflow rate from the deadband flow rate up to the heating maximum flow rate that is less than 50 percent of the zone design peak supply rate.
3 The outdoor airflow rate required to meet the minimum ventilation requirements of Chapter 4 of the International Mechanical Code or **Uniform Mechanical Code**.
4 The minimum primary airflow rate required to meet the simplified procedure ventilation requirements of ASHRAE 62.1 for the zone and is permitted to be the average airflow rate as allowed by ASHRAE 62.1.
5 Any higher rate that can be demonstrated to reduce overall system annual energy use by offsetting reheat/re-cool energy losses through reduction in outdoor air intake for the system as approved by the code official.
6 The airflow rate required to comply with applicable codes or accreditation standards such as pressure relationships or minimum air change rates.

C403.6.6 Multiple-zone VAV system ventilation optimization control. Multiple-zone VAV systems with direct digital control of individual zone boxes reporting to a central control panel shall have automatic controls configured to reduce outdoor air intake flow below design rates in response to changes in system ventilation efficiency (Ev) as defined by the *International Mechanical Code* or **Uniform Mechanical Code**.

C403.7.1 Demand control ventilation. Demand control ventilation (DCV) shall be provided for the following:

1. Spaces with ventilation provided by single-zone systems where an air-side economizer is provided in accordance with Section C403.5.
2. Spaces larger than 250 square feet (23 m2) in Climate Zones 5A, 6, 7, and 8 and spaces larger than 500 square feet (46.5 m2) in other climate zones that have a design occupant load of 15 people or greater per 1,000 square feet (93 m2) of floor area, as established in Table 403.3.1.1 of the International Mechanical Code and Table 402.1 Uniform Mechanical Code, and are served by systems with one or more of the following: 2.1. An air-side economizer.
2.2. Automatic modulating control of the outdoor air damper.
2.3. A design outdoor airflow greater than 3,000 cfm (1416 L/s).

C403.7.2 Parking garage ventilation controls. Ventilation systems employed in enclosed parking garages shall comply with Section 404.1 of the International Mechanical Code or Uniform Mechanical Code and the following:
1 Separate ventilation systems and control systems shall be provided for each parking garage section.
2 Control systems for each parking garage section shall be capable of and configured to reduce fan airflow to not less than 0.05 cfm per square foot [0.00025 m3/(s × m2)] of the floor area served and not more than 20 percent of the design capacity.
3 The ventilation system for each parking garage section shall have controls and devices that result in fan motor demand of not more than 30 percent of design wattage at 50 percent of the design airflow.
Exception: An energy recovery ventilation system shall not be required in any of the following conditions:
1. Where energy recovery systems are prohibited by the International Mechanical Code **or Uniform Mechanical Code**.
2. Laboratory fume hood systems that include not fewer than one of the following features: 2.1. Variable-air-volume hood exhaust and room supply systems configured to reduce exhaust and makeup air volume to 50 percent or less of design values.
2.2. Direct makeup (auxiliary) air supply equal to or greater than 75 percent of the exhaust rate, heated not warmer than 2°F (1.1°C) above room setpoint, cooled to not cooler than 3°F (1.7°C) below room setpoint, with no humidification added, and no simultaneous heating and cooling used for dehumidification control.
3. Systems serving spaces that are heated to less than 60°F (15.5°C) and that are not cooled.
4. Heating energy recovery where more than 60 percent of the outdoor heating energy is provided from site-recovered or site-solar energy in Climate Zones 5 through 8.
5. Enthalpy recovery ratio requirements at heating design condition in Climate Zones0, 1 and 2.
6. Enthalpy recovery ratio requirements at cooling design condition in Climate Zones3C, 4C, 5B, 5C, 6B, 7 and 8.
7. Systems in Climate Zones 0 through 4 requiring dehumidification that employ series energy recovery land have a minimum SERR of 0.40.
8. Where the largest source of air exhausted at a single location at the building exterior is less than 75 percent of the design outdoor airflow rate.
9. Systems expected to operate less than 20 hours per week at the outdoor air percentage covered by Table C403.7.4.2(1).
10. Systems exhausting toxic, flammable, paint or corrosive fumes or dust.
11. Commercial kitchen hoods used for collecting and removing grease vapors and smoke.

C403.7.7 Shutoff dampers. Outdoor air intake and exhaust openings and stairway and shaft vents shall be provided with Class I motorized dampers. The dampers shall have an air leakage rate not greater than 4 cfm/ft2(20.3 L/s × m2) of damper surface area at 1.0 inch water gauge (249 Pa) and shall be labeled by an approved agency when tested in accordance with AMCA 500D for such purpose.
Outdoor air intake and exhaust dampers shall be installed with automatic controls configured to close when the systems or spaces served are not in use or during unoccupied period warm-up and setback operation, unless the systems served require outdoor or exhaust air in accordance with the International Mechanical Code **or Uniform Mechanical Code** or the dampers are opened to provide intentional economizer cooling.
Stairway and elevator shaft vent dampers shall be installed with automatic controls configured to open upon the activation of any fire alarm initiating device of the building's fire alarm system, the interruption of power to the damper, or by thermostatic control systems.

C403.13.1 Duct and plenum insulation and sealing. Supply and return air ducts and plenums shall be insulated with not less than R-6 insulation where located in unconditioned spaces and where located outside the building with not less than R-8 insulation in Climate Zones 0 through 4 and not less than R-12 insulation in Climate Zones 5 through 8. Ducts located underground beneath buildings shall be insulated as required in this section or have an equivalent thermal distribution efficiency. Underground ducts utilizing the thermal distribution efficiency method shall be listed and labeled to indicate the R-value equivalency. Where located within a building thermal envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by not less than R-8 insulation in Climate Zones0 through 4 and not less than R-12 insulation in Climate Zones 5 through 8.
Exceptions:
1. Where located within equipment.
2. Where the design temperature difference between the interior and exterior of the duct or plenum is not greater than 15°F (8°C).
Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the International Mechanical Code **or Sections 603.9 and 603.10 of the Uniform Mechanical Code.**

C403.13.2.1 Low-pressure duct systems. Longitudinal and transverse joints, seams and connections of supply and return ducts operating at a static pressure less than or equal to 2 inches water gauge (w.g.) (498 Pa) shall be securely fastened and sealed
with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems or tapes installed in accordance with the manufacturer's instructions. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the International Mechanical Code or Uniform Mechanical Code.

C403.13.2.2 Medium-pressure duct systems. Ducts and plenums designed to operate at a static pressure greater than 2 inches water gauge (w.g.) (498 Pa) but less than 3 inches w.g. (747 Pa) shall be insulated and sealed in accordance with Section C403.13.1. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the International Mechanical Code **or Uniform Mechanical Code**.

Air leekage change to comply with NRS 701.220(5)

R402.5.1.3 Maximum air leakage rate. Where tested in accordance with Section R402.5.1.2, the air leakage rate for *buildings*, *dwelling units* or *sleeping units* shall be as follows:
1. Where complying with Section R401.2.1, the *building* or the *dwelling units* or *sleeping units* in the *building* shall have an air leakage rate not greater than ~~5.0~~ 4.0 air changes per hour ~~in Climate Zones 0, 1 and 2; 3.0 air changes per hour in Climate Zones 3 through 5; and 2.5 air changes per hour in Climate Zones 6 through 8~~.
2. Where complying with Section R401.2.2 or R401.2.3, the *building* or the *dwelling units* or *sleeping units* in the *building* shall have an air leakage rate not greater than 4.0 air changes per hour, or 0.22 cubic feet per minute per square foot [1.1 L/(s × m2)] of the *building thermal envelope* area or the dwelling *testing unit enclosure area*, as applicable.
Exceptions:
1. Where *dwelling units* or *sleeping units* are attached or located in an R-2 occupancy, and are tested without simultaneously testing adjacent *dwelling units* or *sleeping units*, the air leakage rate is permitted to be not greater than 0.27 cubic feet per minute per square foot [1.4 L/(s × m2)] of the *testing unit enclosure area*. Where adjacent *dwelling units* are simultaneously tested in accordance with ASTM E779, the air leakage rate is permitted to be not greater than 0.27 cubic feet per minute per square foot [1.4 L/(s × m2)] of the *testing unit enclosure area* that separates *conditioned space* from the exterior. 2. Where *buildings* have 1,500 square feet (139.4 m2) or less of *conditioned floor area*, the air leakage rate is permitted to be not greater than 0.27 cubic feet per minute per square foot [1.4 L/(s × m2)].