

TITLE 14 HOUSING AND CONSTRUCTION
CHAPTER 9 MECHANICAL CODES
PART 2 ~~[2006]~~ 2009 NEW MEXICO MECHANICAL CODE

14.9.2.1 ISSUING AGENCY: Construction Industries Division (CID) of the Regulation and Licensing Department.
[14.9.2.1 NMAC - Rp, 14.9.2.1 NMAC, 1-1-08]

14.9.2.2 SCOPE: This rule applies to all contracting work performed in New Mexico on or after ~~[January 1, 2008]~~ July 1, 2010, that is subject to the jurisdiction of CID, unless performed pursuant to a permit for which an application was received by CID before that date.
[14.9.2.2 NMAC - Rp, 14.9.2.2 NMAC, 1-1-08]

14.9.2.3 STATUTORY AUTHORITY: NMSA 1978 Sections 60-13-9 and 60-13-44.
[14.9.2.3 NMAC - Rp, 14.9.2.3 NMAC, 1-1-08]

14.9.2.4 DURATION: Permanent.
[14.9.2.4 NMAC - Rp, 14.9.2.4 NMAC, 1-1-08]

14.9.2.5 EFFECTIVE DATE: ~~[January 1, 2008]~~ July 1, 2010, unless a later date is cited at the end of a section.
[14.9.2.5 NMAC - Rp, 14.9.2.5 NMAC, 1-1-08]

14.9.2.6 OBJECTIVE: The purpose of this rule is to establish minimum standards for the installation, repair, and replacement of mechanical systems including equipment, appliances, fixtures, fittings and/or appurtenances including ventilating, heating, cooling, air conditioning, and refrigeration systems, incinerators, and other energy related systems in New Mexico.
[14.9.2.6 NMAC - Rp, 14.9.2.6 NMAC, 1-1-08]

14.9.2.7 DEFINITIONS:
[See 14.5.1 NMAC, General Provisions and chapter 2 of the ~~[2003]~~ 2009 uniform ~~[plumbing]~~ mechanical code ~~[(UPC)] (UMC)~~ as amended in 14.9.2.10 NMAC.
[14.9.2.7 NMAC - Rp, 14.9.2.7 NMAC, 1-1-08]

14.9.2.8 ADOPTION OF THE ~~[2006]~~ 2009 UNIFORM MECHANICAL CODE:
A. This rule adopts by reference the ~~[2006]~~ 2009 uniform mechanical code, as amended by this rule.
B. In this rule, each provision is numbered to correspond with the numbering of the ~~[2006]~~ 2009 uniform mechanical code.
C. This rule is to be applied in conjunction with 14.7.6 NMAC, the ~~[2006]~~ 2009 New Mexico energy conservation code.
[14.9.2.8 NMAC - Rp, 14.9.2.8 NMAC, 1-1-08; A, 2-24-08]

14.9.2.9 CHAPTER 1 ADMINISTRATION.

- A. Part 1 - General.**
- (1) **101.0 Title.** Delete this section of the UMC and substitute: This code shall be known as the ~~[2003]~~ 2009 New Mexico mechanical code (NMMC).
 - (2) **102.0 Purpose.** Delete this section of the UMC and see 14.9.2.6 NMAC.
 - (3) **103.0 Scope.** Delete this section of the UMC and see 14.9.2.2 NMAC.
 - (4) **104.0 Application to Existing Mechanical Systems.** See this section of the UMC.
 - (5) **105.0 Alternate Materials and Methods of Construction.** Delete this section of the UMC and see 14.5.1 NMAC, General Provisions.
 - (6) **106.0 Modifications.** Delete this section of the UMC and see 14.5.1 NMAC, General Provisions.
 - (7) **107.0 Tests.** See this section of the UMC.
- B. Part II - Organization and Enforcement.**
- (1) **108.0 Powers and Duties of the Authority Having Jurisdiction.**

- (a) **108.1 General.** Delete this section of the UMC and see CILA.
- (b) **108.2 Deputies.** Delete this section of the UMC and see CILA Sections 60-13-8 and 60-13-41 and NMSA 1978 Section 9-16-7.
- (c) **108.3 Right of Entry.** Delete this section of the UMC and see CILA Section 60-13-42.
- (d) **108.4 Stop Orders.** Delete this section of the UMC and see 14.5.2 NMAC, Permits.
- (e) **108.5 Authority to Disconnect Utilities in Emergencies.** Delete this section of the UMC and see CILA Section 60-13-42.
- (f) **108.6 Authority to Condemn Equipment.** Delete this section of the UMC and see 14.5.1 NMAC, General Provisions.

(g) **108.7 Connection After Order to Disconnect.** Delete this section of the UMC and see 14.5.1 NMAC, General Provisions.

(h) **108.8 Liability.** Delete this section of the UMC and see CILA Section 60-13-26.

(i) **108.9 Cooperation of Other Officials and Officers.** Delete this section of the UMC.

(2) **109.0 Unsafe Equipment.** Delete this section of the UMC and see 14.5.1 NMAC, General Provisions.

(3) **110.0 Board of Appeals.** Delete this section of the UMC and see 14.5.1 NMAC, General Provisions.

(4) **111.0 Violations.** Delete this section of the UMC and see CILA Section 60-13-1 et seq., and 14.5.3 NMAC, Inspections.

C. Part III - Permits and Inspections.

(1) **112.0 Permits.** See 14.5.2 NMAC, Permits.

(2) **113.0 Application for Permit.** Delete this section of the UMC and see 14.5.2 NMAC, Permits.

(3) **114.0 Permit Issuance.** Delete this section of the UMC and see 14.5.2 NMAC, Permits.

(4) **115.0 Fees.** Delete this section of the UMC and see 14.5.5 NMAC, Fees.

(5) **116.0 Inspections.** Delete this section of the UMC and see 14.5.3 NMAC, Inspections.

(6) **117.0 Connection approval.** Delete this section of the UMC and see 14.5.2 NMAC, Permits.

(7) **Table 1.1 Mechanical Permit Fees.** Delete this table from the UMC and see 14.5.5 NMAC,

Fees.

D. 116.6 Reinspection. Delete this section of the UMC and see 14.5.5.14 (G) NMAC. [14.9.2.9 NMAC - Rp, 14.9.2.9, NMAC, 1-1-08]

14.9.2.10 CHAPTER 2 DEFINITIONS: See this chapter of the UMC except as provided below.

A. 203.0 Authority having jurisdiction. Delete the text of this definition and substitute: The authority having jurisdiction is the construction industries division (CID) and the bureau chief of the mechanical and plumbing bureau of CID.

B. 214.0 Listed and listing. See this definition in the UPC and add the following provision at the end of the definition: A manufacturer may select the independent certification organization of its choice to certify its products, provided that the certification organization has been accredited by the American national standards institute (ANSI), or another certification organization that CID has approved in writing.

[14.9.2.10 NMAC - Rp, 14.9.2.10 NMAC, 1-1-08]

14.9.2.11 CHAPTER 3 GENERAL REQUIREMENTS: See this chapter of the UMC except as provided below.

A. — 305.1 Accessibility for service. Delete the text of this section, and substitute: All gas utilization equipment shall be located with respect to building construction and other equipment so as to permit access to the gas utilization equipment. Sufficient clearance shall be maintained to permit cleaning of heating surfaces; the replacement of filters, blowers, motors, burners, controls and vent connections; the lubrication of moving parts where necessary; the adjustment and cleaning of burners and pilots; and the proper functioning of explosion vents, if provided. Access openings and passageways to equipment located in attics and under floor spaces shall be provided so the largest piece of equipment can be removed, but in no case less than 22 inches by 30 inches (599 mm by 726 mm). For attic installation, the passageway and servicing area adjacent to the equipment shall be floored. The distance from the passageway access to the equipment shall not exceed 20 feet (6.096 m). A permanent electric outlet and lighting fixture shall be provided at or near the equipment. The light shall be controlled by a switch located at the required passageway opening. Equipment located in under floor spaces shall have a clearance of at least 6 inches (152 mm) from the ground. Excavation necessary to install such equipment shall extend to a depth of 6 inches (152 mm) below, and 12 inches (305 mm) on all sides of the equipment, except the control side, which

shall have 30 inches (762 mm).]

[B] A. [306.0] **305.0 Automatic control devices.** See this section of the UMC and 14.7.6 NMAC. [add the following provision: “Programmable thermostats shall be installed in all new residential construction and public building construction. On existing buildings that are renovated, remodeled, or where additions are made, reasonable measures shall be taken for retrofitting all existing non-programmable thermostats.”]

[C. — **312.0 Air filters.** **312.1** See this section of the UMC but delete the exception.]

B. **311.0 Heating and Cooling Air System.** See this section of the UMC except as provided below.

(1) **311.1 Source.** See this section of the UMC

(2) **311.2 Air Filters.** See this section of the UMC except delete the exception.

(3) **311.3 Prohibited Source.** See this section of the UMC and add the following

(5) A closet, bathroom, laundry room, toilet room or kitchen

(7) Where it will pick up objectionable odors, fumes, or flammable vapors.

D. — **313.0 Equipment efficiency.** See the UMC and add the following new provisions:

(1) — **313.1 Heat pumps.** All heat pumps installed in new construction must have a 13 SEER, or greater, energy efficiency rating.]

(2) — **313.2 Air conditioners.** All air conditioners installed in new construction must have a 13 SEER, or greater, energy efficiency rating.]

[14.9.2.11 NMAC - Rp, 14.9.2.11 NMAC, 1-1-08; A, 2-24-08]

14.9.2.12 CHAPTER 4 VENTILATION AIR SUPPLY: See this chapter of the UMC and add the following material to section 405.0 Evaporative cooling systems: “Barometric relief dampers shall be installed on all new residential evaporative cooling systems to allow conditioned air from occupied spaces to exit the occupied space through a discreet opening in the ceiling, allowing the required air change to pass through the attic space to the outdoors. The authority having jurisdiction shall determine whether relief dampers shall be required on retrofits. Barometric relief dampers shall not be required on flat roof construction. Water saving or water management pumps shall be installed on all new and replaced evaporative coolers.”

[14.9.2.12 NMAC - Rp, 14.9.2.12 NMAC, 1-1-08; A, 2-24-08]

14.9.2.13 CHAPTER 5 EXHAUST SYSTEMS: See this chapter of the UMC except as provided below.

[A. — **504.3.2.2 Length limitation.** See this section of the UMC except delete everything after the words “total combined horizontal and vertical length” and substitute: of 23 feet (7m) with two ninety degree (90°) elbows and a full 4 inch (102 mm) vent cap opening, or 33 feet (10 m) with one ninety degree (90°) elbow and a full 4 inch (102 mm) vent cap opening. Ten feet (3.05 m) shall be deducted for each additional ninety degree (90°) elbow in excess of the number allowed.]

[B. — **507.6 Hoods required.** Add this new section: hoods shall be installed at or above all commercial type deep fat fryers, broilers, fry grills, steam jacketed kettles, hot top ranges, ovens, barbecues, rotisseries, dishwashing machines and similar equipment that produce comparable amounts of steam, smoke, grease, or heat in a food processing establishment. For the purposes of this section, a food processing establishment includes any building or portion thereof used for the processing of food, but does not include a dwelling unit.]

[C]A. **511.3 Replacement air.** See this section of the UMC except add the following: windows and doors shall not be used for the purpose of providing replacement air. The exhaust and replacement air systems shall be connected by an electrical interlocking switch. When using equipment that is not listed for make-up air, a device to sense continued air movement within the replacement air plenum shall be installed initiating a complete system shut-down if air-flow is interrupted.

[14.9.2.13 NMAC - Rp, 14.9.2.13 NMAC, 1-1-08]

14.9.2.14 CHAPTER 6 DUCT SYSTEMS: See this chapter of the UMC except as follows.

A. **Section [604.1]604.7. Location of ducts.** Duct work shall not be installed in exterior walls or exterior to the thermal envelope unless the insulation of the duct work meets or exceeds the insulation requirement applicable to the exterior walls of the building.

B. **Section 604.3 Factory-Made Air Ducts.** See this section of the UMC and add the following the end of the third paragraph: The use of flexible duct shall be limited to supply- and return-air run-outs of not more than 12 feet in length. Flexible duct shall not be used for the main supply- and/or return-air plenum.

[B]C. **Section 605.0 Insulation of ducts.** See this section of the UMC except as follows.

(1) **Table 6-6 A. Minimum duct insulation R value cooling and heating only supply ducts and**

return ducts.

(a) **Heating only ducts** - Delete the entries for envelope criteria table 5-13 to 5-15 and substitute the following:

- (i) exterior: R-8;
- (ii) ventilated Attic: R-6;
- (iii) unvented attic w/ backloaded ceiling: R-6;
- (iv) unvented attic w/ roof insulation: R-6;
- (v) unconditioned space: R-6;
- (vi) indirectly conditioned space: R-3.5; [and]
- (vii) buried: none.

(b) **Cooling only ducts** - Delete the entries for envelope criteria table 5-7, 9, 11, 13,16 and substitute the following:

- (i) exterior: R-8 or the R-factor of insulation in the exterior wall on which the duct is located;
- (ii) ventilated Attic: R-6;
- (iii) unvented attic w/ backloaded ceiling: R-6;
- (iv) unvented attic w/ roof insulation: R-6;
- (v) unconditioned space: R-6;
- (vi) indirectly conditioned space: R3.5; [and]
- (vii) buried: none.

(2) **Table 6-6 B Minimum duct insulation [R] R value combined heating and cooling ducts.**

Delete the entries for envelope criteria table 5-13 and substitute the following:

- (a) exterior: [R-6] R-8;
- (b) ventilated Attic: R-6;
- (c) unvented attic w/ backloaded ceiling: R-6;
- (d) unvented attic w/ roof insulation: R-6;
- (e) unconditioned space: R-6;
- (f) indirectly conditioned space: [none] 3.5
- (g) buried: R-3.5.

(3) Delete exception (C).

[C]D. Section 604.2. Metal ducts. See this section of the UMC and add the following to the last sentence of the second paragraph, "and be installed so as to support the weight of the concrete during encasement."

[D]E. Section 609.0 Automatic shutoffs: See this section of the UMC and add the following to the exception: (6) Automatic shutoffs are not required on evaporative coolers that derive all of their air from outside the building.

[14.9.2.14 NMAC - Rp, 14.9.2.14 NMAC, 1-1-08; A, 2-24-08]

14.9.2.15 CHAPTER 7 COMBUSTION AIR: See this chapter of the UMC.

[14.9.2.15 NMAC - Rp, 14.9.2.15 NMAC, 1-1-08]

14.9.2.16 CHAPTER 8 CHIMNEYS AND VENTS: See this chapter of the UMC.

[14.9.2.16 NMAC - Rp, 14.9.2.16 NMAC, 1-1-08]

14.9.2.17 CHAPTER 9 INSTALLATION OF SPECIFIC EQUIPMENT: See this chapter of the UMC except as provided below.

[A. Section 904.7 Furnace plenums and air ducts. See this section of the UMC and add the following new section: "**Section 904.7 (E) Prohibited sources.** Outside or return air for a heating system shall not be taken from the following locations:

(1) Closer than 10 feet (3048 mm) from an appliance vent outlet, a vent opening of a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is three (3) feet (914 mm) above the outside air inlet.

(2) Where it will pick up objectionable odors, fumes or flammable vapors; or where it is less than ten (10) feet (3048 mm) above the surface of any abutting public way or driveway; or where it is in a horizontal position in a sidewalk, street, alley or driveway.

(3) A hazardous or unsanitary location or a refrigeration machinery room as defined in this code.

(4) From an area, the volume of which is less than twenty five percent (25%) of the entire volume served by such system, unless there is a permanent opening to an area the volume of which is equal to twenty five percent (25%) of the entire volume served. Exception: Such opening when used for a warm air furnace in a dwelling unit may be reduced to no less than fifty percent (50%) of the required area; provided the balance of the required return air is taken from a room or hall having at least three (3) doors leading to other rooms served by the furnace.

(5) From a room or space having any fuel burning appliances therein. Exception: This shall not apply to:

(a) a gravity type or listed vented wall furnace;

(b) a blower type system complying with the following requirements:

(i) where the return air is taken from a room or space having a volume exceeding one (1) cubic foot (0.0028 cubic meters) for each 10 Btu/hr (2.93 w) fuel input rate of all fuel burning appliances therein;

(ii) at least seventy five percent (75%) of the supply air is discharged back into the same room or space; or

(iii) return air inlet shall not be located within ten (10) feet (3048 mm) of any appliance firebox or draft diverter in the same enclosed room or confined space.

(6) A closet, bathroom toilet room or kitchen.

(7) Return air from one dwelling unit shall not be discharged into another dwelling unit through the heating system.]

[B]C. Section 904.10.3 Access to equipment on roofs.

(1) 904.10.[3.]1 See this section of the UMC.

(2) 904.10.[3.]2 See this section of the UMC except after the words "in height" add the following: except those designated as R-3 occupancies.

[C]D. 907.2 Installation. See this section of the UMC except add the following: Installation of gas logs in solid fuel burning fireplaces. Approved gas logs may be installed in solid fuel burning fireplaces, provided.

(1) The gas log is installed in accordance with the manufacturer's installation instructions

(2) If the fireplace is equipped with a damper, it shall be permanently blocked open by welding or cutting a hole of sufficient size to prevent spillage of combustion products into the room. On eight (8) inch and smaller flues, the damper shall be removed.

(3) The minimum flue passageway shall not be less than 1 square inch per 2000 Btu/h input.

(4) Gas logs shall be equipped with a pilot and listed safety shutoff valve.

(5) The use of flexible gas connections shall not be permitted within a firebox, unless it is part of the listed gas log assembly.

(6) Factory built fireplaces shall be approved for installation of gas logs and provided with a means of installing the gas piping.

(7) All gas outlets located in a barbecue or fireplace shall be controlled by an approved separating valve located in the same room and outside the hearth, but not less than six (6) feet from such outlets.

[D]E. Section 928.[4]2 [Installation] Location. See this section of the UMC except add [this new subsection: (F)] the following to the end: [Vented wall furnaces designed to be installed in a nominal 4 inch (102 mm) will shall be not less than 6 inches (152 mm) from an inside room corner unless listed for lesser clearances. Vented wall furnaces shall be located so that a door cannot swing within 12 inches (305 mm) of an air inlet or an air out let of such furnace measured at right angles to the opening. Doorstops or door closers shall not be installed to obtain this clearance. Except when specifically approved, vented wall furnaces shall be installed at least 18 inches (457 mm) below any structural projection. This requirement includes doors and windows which could project over the furnace.] Unlisted wall furnaces shall be installed with clearances to combustible material of not less than eighteen (18) inches (460 mm).

[14.9.2.17 NMAC - Rp, 14.9.2.17 NMAC, 1-1-08]

14.9.2.18 CHAPTER 10 STEAM AND HOT WATER BOILERS: See this chapter of the UMC.

[14.9.2.18 NMAC - Rp, 14.9.2.18 NMAC, 1-1-08]

14.9.2.19 CHAPTER 11 REFRIGERATION: See this chapter of the UMC.

[14.9.2.19 NMAC - Rp, 14.9.2.19 NMAC, 1-1-08]

14.9.2.20 CHAPTER 12 HYDRONICS: See this chapter of the UMC except as provided below.

A. **201.2.8.3 Pressure test.** See this section of the UMC [E]except delete the first sentence and

substitute: piping shall be tested with a hydrostatic pressure or an air test of not less than 1.5 times operating pressure.

B. ~~1201.3.6.3 Pressure test.~~ Except delete the first sentence and substitute: piping shall be tested with a hydrostatic pressure or an air test of not less than 1.5 times operating pressure.]

C. **1201.[4] 3.1.1. PEX tubing.** See this section of the UMC except add the following: tubing shall be manufactured with an approved oxygen diffusion barrier.
[14.9.2.20 NMAC - Rp, 14.9.2.20 NMAC, 1-1-08]

14.9.2.21 CHAPTER 13 FUEL PIPING: See this chapter of the UMC except as provided below.

A. **1309.5.2.3** Copper and brass pipe shall not be used. Aluminum alloy pipe shall not be used with gases corrosive to such material.

B. **131[4]2.1.2. Protection against damage.** Delete the text of subsection (A) of this section of the UMC, cover requirements, and substitute: Underground piping systems shall be installed with a minimum of 18 inches (460 mm) of cover. Where 18 inches (460 mm) of cover cannot be provided, the pipe shall be installed in conduit or bridged (shielded).

C. **131[4]2.9.3 Emergency shutoff valves.** See this section of the UMC except delete the following: the emergency shutoff valves shall be plainly marked as such and their locations posted as required by the authority having jurisdiction. See this is section of the UMC except add the following to the end: For purposes of isolation and safety, an additional gas shut off shall be installed downstream of the serving supplier gas meter prior to any distribution of gas into the gas piping system

D. ~~1312.7 Sediment trap.~~ See this section of the UPC except delete the first sentence and substitute: If a sediment trap, which is not incorporated as a part of the gas utilization equipment, is installed, it shall be installed at the time the equipment is installed and as close to the inlet of the equipment as is practical.]

D. **1312.13 Electrical Bonding and Grounding.** Delete this section of the UMC and see the New Mexico Electrical Code (NMEC).

E. **131[3]5.0 Liquefied petroleum gas facilities and piping.** Delete this section of the UPC and substitute the following: Liquefied petroleum gas facilities shall comply with 19.15.40 NMSA, liquefied petroleum gas standards, and NMSA 1978 70-5-1 et seq., liquefied and compressed gasses.
[14.9.2.21 NMAC - Rp, 14.9.2.21 NMAC, 1-1-08]

14.9.2.22 CHAPTER 14 PROCESS PIPING: See this chapter of the UMC.

[14.9.2.22 NMAC - Rp, 14.9.2.22 NMAC, 1-1-08]

14.9.2.23 CHAPTER 15 SOLAR SYSTEMS: See this chapter of the UMC.

[14.9.2.23 NMAC - Rp, 14.9.2.23 NMAC, 1-1-08]

14.9.2.24 CHAPTER 16 STATIONARY [FUEL-CELL] POWER PLANTS: See this chapter of the UMC.

[14.9.2.24 NMAC - Rp, 14.9.2.24 NMAC, 1-1-08]

14.9.2.25 CHAPTER 17 STANDARDS: See this chapter of the UMC and add the following:

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[14.9.2.25 NMAC - Rp, 14.9.2.25 NMAC, 1-1-08]

14.9.2.26 APPENDICIES: See this section of the UMC.

[14.9.2.26 NMAC - Rp, 14.9.2.26 NMAC, 1-1-08]

14.9.2.27 ENERGY CONSERVATION AND EFFICIENCY.

A. Residential energy efficiency. See chapter four of the New Mexico energy conservation code and include the following:

(1) Programmable thermostat. See chapter four of the New Mexico energy conservation code and add the following exceptions:

Exception:

1) Where the home is registered through a recognized performance-based certification program.

2) Where approved alternative methods of construction and/or materials may be used.

programmable thermostats may be omitted.

(2) Sealing (Mandatory). All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints, seams and penetrations of duct systems shall be made air-tight by means of mastics, gasketing, or other means in accordance with the New Mexico mechanical code. Register penetrations shall be sealed to the wall or floor assemblies. Where HVAC duct penetrates a conditioned space, the duct penetration shall be sealed to the wall or floor assembly to prevent leakage into an unconditioned space.

(3) Duct Insulation. Ducts shall be insulated as required by the New Mexico mechanical code.

(4) Piping insulation. All plumbing and mechanical hot water piping systems shall be insulated to a minimum of R-2. A means of manual disconnect must be installed on all circulating pumps.

(5) Equipment sizing. Heating and cooling equipment shall be sized in accordance with chapter 9 and 17 of the New Mexico mechanical code. The calculations used to determine the equipment size for the residence must be included with the submittal documents and approved by the authority having jurisdiction.

(6) Systems serving multiple dwelling units (Mandatory). Systems serving multiple dwelling units as defined in the New Mexico residential building code shall comply with Sections 503 and 504 of the New Mexico energy conservation code, Chapters 6 and 17 of the New Mexico mechanical code. The calculations used to determine the equipment size for the residence must be included with the submittal documents and approved by the authority having jurisdiction.

(7) Fans. Ventilating fans shall meet energy star requirements.

Exception: Ventilating fans in half bathrooms that do not contain a bathtub, shower, spa or similar source of moisture are exempt from the energy star requirement.

B. Commercial energy efficiency. See chapter five of the New Mexico energy conservation code and include the following:

(1) Calculation of heating and cooling loads. Design loads shall be determined in accordance with the procedures described in the ASHRAE/ACCA Standard 183. The design loads shall account for the building envelope, lighting, ventilation, and occupancy loads based on the project design. Heating and cooling loads shall be adjusted to account for the load reductions that are achieved when energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE *HVAC Systems and Equipment Handbook*. Alternatively, design loads shall be determined by an approved equivalent computation procedure, using the design parameters specified in the New Mexico energy conservation code.

(2) Equipment and system sizing. The output capacity of the heating and cooling equipment and systems shall not exceed the loads calculated in accordance with the New Mexico energy conservation code. A single piece of equipment providing both heating and cooling must satisfy this provision. Or with either the heating or cooling function.

(3) Controls.

(a) Zone Thermostatic Controls.

(i) General. The supply of heating and cooling energy to each zone shall be individually controlled by thermostatic controls responding to temperature within the zone.

Exceptions: Independent perimeter systems that are designed to offset only building envelope loads shall be permitted to serve one or more zones also served by an interior system provided:

(a) the perimeter system includes at least one thermostatic control zone for each building exposure having exterior walls facing only one orientation for fifty (50) contiguous feet or more, and

(b) the perimeter system heating and cooling supply is controlled by a thermostatic control(s) located within the zone(s) served by the system.

Exterior walls are considered to have different orientations if the directions they face differ by more than forty-five (45) degrees.

(ii) Dead band. Where used to control both heating and cooling, zone thermostatic controls shall be capable of providing a temperature range or dead band of at least 5°F within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum. [ASHRAE 90.1:6.4.3.1.2]

Exceptions:

(a) Thermostats that require manual changeover between heating and cooling modes

(b) Special occupancy or special applications where wide temperature ranges are not acceptable (such as retirement homes, proves applications, museums, some areas of hospitals) and are approved by the authority having jurisdiction.

(b) Setpoint overlap restriction. Where heating and cooling to a zone are controlled by separate zone thermostatic controls located within the zone, means (such as limit switches, mechanical stops, or, for DDC systems, software programming) shall be provided to prevent the heating setpoint from exceeding the cooling setpoint minus any applicable proportional band [ASHRAE 90.1: 6.4.3.2].

(c) Off-hour controls. HVAC systems shall have the off-hour controls required by the New Mexico energy conservation code.

Exceptions:

(i) HVAC systems intended to operate continuously.

(ii) HVAC systems having a design heating capacity and cooling capacity less than 15,000 Btu/h that are equipped with readily accessible manual ON/OFF controls.

(d) Automatic shutdown. HVAC systems shall be equipped with at least one of the following:

(i) Controls that can start and stop the system under different time schedules for seven different day-types per week, are capable of retaining programming, and time setting during loss of power for a period of at least ten hours, and include an accessible manual override, or equivalent function, that allows temporary operation of the system for up to two (2) hours.

(ii) An occupant sensor that is capable of shutting down the system off when no occupant is sensed for a period of up to thirty (30) minutes.

(iii) A manually operated timer capable of being adjusted to operate the system for up to two (2) hours.

(iv) An interlock to a security system that shuts the system off when the security system is activated [ASHRAE 90.1: 6.3.3.1].

Exception: Residential occupancies may use controls that can start and stop the system under two different time schedules per week.

(e) Setback controls. Heating systems located in climate zones 2-8 shall be equipped with controls that have the capability to automatically restart and temporarily operate the system as required to maintain zone temperatures above a heating setpoint adjustable down to 55°F or lower. Cooling systems located in climate zones 1b, 2b, 3b, 4b, and 5b shall be equipped with controls that have the capability to automatically restart and temporarily operate the system as required to maintain zone temperatures below a cooling setpoint adjustable up to 90°F or higher or to prevent high space humidity levels [ASHRAE 90.1: 6.4.3.3.2].

Exception: Radiant floor and ceiling heating systems.

(f) Optimum start controls. Individual heating and cooling air distribution systems with a total design supply air capacity exceeding 10,000 cfm, served by one or more supply fans, shall have optimum start controls. The control algorithm shall, as a minimum, be a function of the difference between space temperature and occupied setpoint and the amount of time prior to scheduled occupancy [ASHRAE 90.1: 6.4.3.3.3].

(g) Zone isolation. HVAC systems serving zones that are intended to operate or be occupied non-simultaneously shall be divided into isolation areas. Zones may be grouped into a single isolation area provided it does not exceed 25,000 ft² of conditioned floor area nor include more than one floor. Each isolation area shall be equipped with isolation devices capable of automatically shutting off the supply of conditioned air and outdoor air to and exhaust air from the area. Each isolation area shall be controlled independently by a device meeting the requirements of the New Mexico energy conservation code. Automatic shutdown for central systems and plants, controls and devices shall be provided to allow safe system and equipment operation for any length of time while serving only the smallest isolation area served by the system or plant [ASHRAE 90.1:6.4.3.3.4].

Exceptions:

(i) Exhaust air and outdoor air connections to isolation zones when the fan system to which the connection is 5000 cfm and smaller.

(ii) Exhaust airflow from a single isolation zone of less than 10% of the design airflow of the exhaust system to which it connects.

(iii) Zones intended to operate continuously or intended to be inoperative only when all other zones are inoperative.

(h) Automatic start capabilities. Controls designed to automatically adjust the start time of an HVAC system each day to allow for automatically bringing the space to desired occupied temperature levels before scheduled occupancy shall be provided on each system.

(i) Shutoff damper controls. See the New Mexico energy conservation code except delete the three exceptions and replace with the following exception: Exception: Gravity (non-motorized) dampers having a maximum leakage rate of 20 cfm per square foot (34 L/s • C m²) at 1.0 inch water gauge (w.g.) (1250 Pa) when tested in accordance with AMCA 500D are permitted to be used where the design exhaust capacity does not exceed 300 cfm or barometric relief dampers integral with manufacturer's equipment or by engineered systems.

(j) Snow Melt system controls. See this section of the New Mexico energy conservation code.

(k) Freeze Protection. Freeze protection systems shall include automatic controls capable of shutting off the systems when outdoor air temperatures are above 40°F or when the conditions of the protected fluid will prevent freezing. Freeze protection systems shall be installed as allowed under alternate materials and methods of installation and in accordance with currently recognized engineering practices.

(l) Ventilation. See this section of the IECC except as provided below:

(i) Demand or CO₂ Controlled Ventilation. Demand control ventilation (DCV) or CO₂ controlled ventilation is required for spaces larger than 500 ft² (50m²) and with an average occupant load of 25 people per 1000 ft² (93 m²) of floor area and served by systems with one or more of the following: 1. An air-side economizer; 2. Automatic modulating control of the outdoor air damper; or 3. A design outdoor airflow greater than 3,000 cfm (1400 L/s).

(a) Exceptions:

(i) Systems with energy recovery complying with Section 503.2.6.

(ii) Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.

(iii) System with a design outdoor airflow less than 1,200 cfm (600 L/s).

(iv) Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1,200 cfm (600 L/s).

(v) Building spaces where the primary ventilation needs are for process loads.

(5) Kitchen Hoods. Individual commercial kitchen exhaust hoods shall be provided with makeup air sized for at least 50% of exhaust air volume that is unheated or heated to no more than 60°F and uncooled or cooled without the use of mechanical cooling.

(a) Exceptions:

(i) Where hoods are used to exhaust ventilation air that would otherwise exfiltrate or be exhausted by other fan systems.

(ii) Certified grease extractor hoods that require a face velocity no greater than 60 fpm.

(6) Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 3,000 cfm (1.42 m³/s) or greater and a minimum outside air supply of 50 percent or greater of the design supply air quantity shall have an energy recovery system that provides a change in the enthalpy of the outdoor air supply of 50 percent or more of the difference between the outdoor air and return air at design conditions. Provision shall be made to bypass or control the energy recovery system to permit cooling with outdoor air where cooling with outdoor air is required.

(a) Exceptions:

(i) Laboratory systems.

(ii) Systems serving spaces that are not cooled and that are heated to less than 60°F.

(iii) Systems exhausting toxic, flammable, paint, or corrosive fumes or dust.

(iv) Commercial kitchen hoods used for collecting and removing grease vapors and smoke.

(v) Where more than 60% of the outdoor air heating energy is provided from site recovered or site-solar energy.

(vi) Where the largest exhaust source is less than 75% of the design outdoor airflow.

(vii) Systems requiring dehumidification that employ energy recovery in series with the cooling coil.

(7) Mechanical systems test and balancing requirements. Mechanical systems test and balancing shall be in accordance with the provisions of the New Mexico energy conservation code

(a) Exception: Buildings less than 4,000 sq. ft

(i) System test and balancing. The construction documents shall require test and balancing in accordance with this section. In addition to test and balancing prerequisites, construction documents shall be permitted to refer to equipment specifications for further requirements. The building official shall be provided test and balancing documentation for review purposes.

(a) Test and balance plan. A test and balancing plan shall be prepared for all systems as described in the New Mexico energy conservation code and shall include as a minimum the following items:

(i) A detailed explanation of the building's project requirements for mechanical design.

- (ii) A narrative describing the activities that will be accomplished during each phase of test and balancing, including guidance on who accomplishes the activities and how they are completed.
- (iii) Equipment and systems to be tested, including the extent of tests.
- (iv) Functions to be tested (for example calibration, economizer control, etc.).
- (v) Conditions under which the test shall be performed (for example winter and summer design conditions, full outside air, etc.), and
- (vi) Measurable criteria for acceptable performance.
- (vii) A two-week building purge of volatile organic compounds and other toxins, or a purge timed in accordance with a recognized alternative design building program.
- (viii) A final system test and balance within 90 days of occupancy and subsequent to building purge.
- (ix) A line-item completion schedule for inspection review.
- (x) An engineer's certificate of acceptance.

Test and balancing shall be performed for all HVAC systems in accordance with Level 1, Basic Commissioning of the SMACNA HVAC Systems Commissioning Manual. Note: See Appendix C of the uniform mechanical code for additional information on HVAC system testing.

(b) Systems adjusting and balancing. All HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within 10% of design rates. Test and balance activities shall include as a minimum the following items:

(i) Air systems balancing: Each supply air outlet and zone terminal device shall be equipped with means for air balancing. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 5 hp (9.3 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses, then for fans with system power of greater than 1 hp. Fan speed shall be adjusted to meet design flow conditions.

(ii) Exception: Fans with fan motors of 1 hp or less.

a) Hydronic systems balancing: Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the ability to measure pressure across the pump, or test ports at each side of each pump.

(iii) Exceptions: Pumps with pump motors of 2 hp or less.

a) When throttling results in no greater than 5% of the nameplate horsepower draw above that required if the impeller were trimmed.

(c) Functional performance testing. Equipment functional performance testing shall be in accordance with New Mexico energy conservation code. Functional testing of HVAC controls shall be in accordance with New Mexico energy conservation code.

(i) Equipment functional performance testing. Equipment functional performance testing shall demonstrate the correct installation and operation of components, systems, and system-to-system interfacing relationships in accordance with approved plans and specifications. This demonstration is to prove the operation, function, and maintenance serviceability for each of the systems. Testing shall include all modes of operation, including:

(a) All modes as described in the Sequence of Operation.

(b) Redundant or automatic back-up mode.

(c) Performance of alarms, and

(d) Mode of operation upon a loss of power and restored power.

(ii) Controls functional performance testing. HVAC control systems shall be tested to document that control devices, components, equipment, and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with approved plans and specifications.

(iii) Economizer Functional Testing. All air economizers shall be tested to document that the installation and operation are in accordance with manufacturer's specifications.

(d) Test and balance report. A report of test and balancing procedures and results shall be completed and provided to the building owner. The report shall be identified as "Test and Balance Report" and shall identify:

(i) Itemization of deficiencies found during testing required by this section which have not been corrected at the time of report preparation and the anticipated date of correction.

(ii) Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

(iii) Climatic conditions required for performance of the deferred tests, and the anticipated date of each deferred test.

(8) **Acceptance.** Buildings, or portions thereof, required to comply with this section shall not be issued a final certificate of occupancy until such time that the code official has received a certificate of acceptance per the New Mexico energy conservation code. At the request of the code official, a copy of the Preliminary Test and Balance Report shall be made available for review.

(a) Exception: In cases where a third party is contracted to complete the Testing and Balancing, a certificate of occupancy may be issued prior to receipt of Testing and Balancing Report.

(9) **Completion requirements.**

(a) **Drawings.** Construction documents shall include as a minimum the location and performance data on each piece of equipment.

(b) **Manuals.** An operating manual and a maintenance manual shall be in accordance with industry-accepted standards and shall include, at a minimum, the following:

(i) Capacity (input and output) and required maintenance actions for each piece of equipment.

(ii) Operation and maintenance manuals for each piece of equipment.

(iii) Manufacturer's operation manuals and maintenance manuals for each piece of equipment requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions shall be clearly identified.

(iv) Names and addresses of at least one service agency.

(v) HVAC controls system maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings at control devices or, for digital control systems in programming comments.

(vi) A complete narrative of how each system is intended to operate, including suggested recommended setpoints.

(10) **System balancing report.** A written report describing the activities and measurements completed in accordance with the New Mexico energy conservation code.

(a) **Final Report.** A complete report of test procedures and results identified as "Final Report" shall include:

(i) Results of all Functional Performance Tests.

(ii) Disposition of all deficiencies found during testing, including details of corrective measures used or proposed.

(iii) All Functional Performance Test procedures used during the test and balancing process including measurable criteria for test acceptance, provided herein for repeatability.

(iv) Engineer's sealed certificate of acceptance.

(a) **Exception:** Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

(11) **HVAC systems and equipment (Prescriptive).** See this section of the New Mexico energy conservation code except as provided below:

(a) **Economizers.** See this section of the New Mexico energy conservation code .

(i) **Exceptions:** Economizers are not required for the systems listed below.

(a) Packaged rooftop equipment with less than 5 tons of cooling.

(b) Individual fan-cooling units with a supply capacity less than the minimum listed in the ne Mexico energy conservation code.

(c) Systems that require filtration equipment in order to meet the minimum ventilation requirements of this code.

(d) Where more than 25% of the air designed to be supplied by the system is to spaces that are designed to be humidified above 35°F dew-point temperature to satisfy process needs.

(e) Systems that include a condenser heat recovery system required by Section 503.4.6.

(f) Systems that serve *residential* spaces where the system capacity is less than five times the requirement listed in the New Mexico energy conservation code.

(g) Systems that serve spaces whose sensible cooling load at design conditions, excluding transmission and infiltration loads, is less than or equal to transmission and infiltration losses at an outdoor temperature of 60°F.

(h) Systems expected to operate less than 20 hours per week.

(i) Where the use of *outdoor air* for cooling will affect supermarket open refrigerated casework systems.

(j) Where the cooling *efficiency* meets or exceeds the *efficiency* requirements in the New Mexico energy conservation code.

(b) Air Economizers Air economizers shall be designed in accordance with Sections the New Mexico energy conservation code.

(i) **Design Capacity.** Air economizer systems shall be capable of modulating *outdoor air* and return air dampers to provide up to 100% of the design supply air quantity as *outdoor air* for cooling.

(a) **System Control.** Air economizer control systems shall be wired to ensure economizer will operate when mechanical cooling is enabled. The cooling unit shall utilize a staged control system that also allows for the economizer to operate when the unit compressor is not under operation.

(ii) **Control Signal.** Economizer dampers shall be capable of being sequenced with the mechanical cooling equipment and shall not be controlled by only mixed air temperature.

(a) **Exception:** The use of mixed air temperature limit control shall be permitted for systems controlled from space temperature (such as single-zone systems).

(iii) **High-Limit Shutoff.** All air economizers shall be capable of automatically reducing *outdoor air* intake to the design minimum *outdoor air* quantity when *outdoor air* intake will no longer reduce cooling energy usage. High-limit shutoff control types for specific climates shall be chosen from the New Mexico energy conservation code. High-limit shutoff control settings for these control types shall be those listed in the New Mexico energy conservation code.

(iv) **Relief of Excess Outdoor Air.** Systems shall provide a means to relieve excess *outdoor air* during air economizer operation to prevent over-pressurizing the building. The relief air outlet shall be located to avoid recirculation into the building.

(c) Water Economizers. Water Economizer systems for complex HVAC Equipment shall be designed in accordance with the New Mexico energy conservation code.

(i) **Design Capacity.** Water economizer systems shall be capable of cooling supply air by indirect evaporation and providing up to 100% of the expected system cooling load at *outdoor air* temperatures of 50°F dry bulb/45° wet bulb and below.

(a) **Exception:** Systems in which a water economizer is used and where dehumidification requirements cannot be met using outdoor air temperatures of 50°F dry bulb/ 45°F wet bulb must satisfy 100% of the expected system cooling load at 45°F dry bulb/40°F wet bulb.

(ii) **Maximum Pressure Drop.** Pre-cooling coils and water-to-water heat exchangers used as part of a water economizer system shall either have a water-side pressure drop of less than 15 ft of water or a secondary loop shall be created so that the coil or heat exchanger pressure drop is not seen by the circulating pumps when the system is in the normal cooling (non-economizer) mode.

(d) Integrated Economizer Control. Economizer systems shall be integrated with the mechanical cooling system and be capable of providing partial cooling even when additional mechanical cooling is required to meet the remainder of the cooling load.

(i) Exceptions:

(a) Direct expansion systems that include controls that reduce the quantity of *outdoor air* required to prevent coil frosting at the lowest step of compressor unloading, provided this lowest step is no greater than 25% of the total system capacity.

(b) Individual direct expansion units that have a rated cooling capacity less than 54,000 Btu/h and use non-integrated economizer controls that preclude simultaneous operation of the economizer and mechanical cooling.

(c) Systems in climate zones 1A, 1B, 2A, 7, 8.

(e) Economizer Heating System Impact. HVAC system design and economizer controls shall be such that economizer operation does not increase the building heating energy use during normal operation.

(i) **Exception:** Economizers on VAV systems that cause zone level heating to increase due to a reduction in supply air temperature.

(f) Complex HVAC systems and equipment (Prescriptive). See the New Mexico energy conservation code except as provided below:

(i) Variable air volume (VAV) fan control. See this section of the New Mexico energy conservation code and add the following:

(a) Individual VAV fans with motors of 5 horsepower (3.7 kW) or greater shall be:

(i) Driven by a mechanical or electrical variable speed drive;

(ii) Driven by a vane-axial fan with variable-pitch blades; or

(iii) The fan shall have controls or devices that will result in fan motor demand of no more than 30 percent of their design wattage at 50 percent of design airflow when static pressure set point equals one-third of the total design static pressure, based on manufacturer's certified fan data.

Static pressure sensors used to control VAV fans shall be placed in a position such that the controller setpoint is no greater than one-third the total design fan static pressure, except for systems with direct digital control. If this results in the sensor being located downstream of major duct splits, multiple sensors shall be installed in each major branch to ensure the static pressure can be maintained in each branch.

For systems with direct digital control of individual zone boxes reporting to the central control panel, the static pressure set point shall be reset based on the zone requiring the most pressure, i.e., the set point is reset lower until one zone damper is nearly wide open.

HISTORY OF 14.9.2 NMAC:

Pre-NMAC History: The material in this part was derived from that previously filed with state records center and archives under:

CIC MB 68-2, 1964 New Mexico Plumbing Code, filed 1/23/68.

CIC MB 70-8, 1970 Plumbing Code of New Mexico, filed 4/29/70.

CIC MB 71-4, 1970 Plumbing Code of New Mexico, filed 6/8/71.

CIC MB 74-9, 1973 Uniform Plumbing Code, filed 11/20/74.

CIC 76-1, 1976 Uniform Plumbing Code, filed 5/4/76.

CIC MB 80-5, 1979 Uniform Plumbing Code, filed 4/24/80.

MB-UPC-82-1, 1982 Uniform Plumbing Code, filed 11/4/82.

MB-UPC-85-1, 1985 Uniform Plumbing Code, filed 10/1/85.

MB-UPC-88-1, 1988 Uniform Plumbing Code, filed 12/15/88.

MB-UPC-91-1, 1991 Uniform Plumbing Code, filed 7/28/92.

CIC MB 68-3, 1966 New Mexico Gas Code, filed 1/23/68.

CIC MB 70-7, 1970 Natural Gas Code of New Mexico, filed 4/29/70.

CIC MB 71-3, 1970 Natural Gas Code of New Mexico, filed 6/8/71.

CIC-74-8, 1973 Uniform Mechanical Code, filed 11/20/74.

CIC 76-4, 1976 Uniform Mechanical Code, filed 11/24/76.

CID MB 80-3, 1979 Uniform Mechanical Code, filed 4/23/80.

MB-UMC-82-1, 1982 Uniform Mechanical Code, filed 11/4/82.

MB-UMC-85-1, 1985 Uniform Mechanical Code, filed 10/1/85.

MB-UMC-88-1, 1988 Uniform Mechanical Code, filed 12/15/88.

MB-UMC-91-1, 1991 Uniform Mechanical Code, filed 7/28/92.

CIC 77-3, 1976 New Mexico Uniform Solar Energy Code, 2/26/77.

CID MB-80-6, 1979 Uniform Solar Energy Code, 4/24/80.

MB-USEC-82-1, 1982 Uniform Solar Energy Code, filed 11/4/82.

MB-USEC-85-1, 1985 Uniform Solar Energy Code, 12/23/85.

MB-USEC-88-1, 1988 Uniform Solar Energy Code, 12/15/88.

MB-USEC-91-1, 1991 Uniform Solar Energy Code, 7/28/92.

CIC-75-1, 1973 Uniform Swimming Pool Code, Section 1.7, 10/31/75.

CIC-76-3, 1976 Uniform Swimming Pool Code, 7/27/76.

CIC MB 80-4, 1979 Uniform Swimming Pool Code, filed 4/23/80.

MB-USPC-82-1, 1982 Uniform Swimming Pool Code, 11/4/82.

MB-USPS and HTC-85-1, 1985 Uniform Swimming Pool, Spa and Hot Tub Code, 12/23/85.

MB-USPS and HTC-88-1; 1988 Uniform Swimming Pool, Spa and Hot Tub Code, 12/15/88.

MB-USPS and HTC-91-1, 1991 Uniform Swimming Pool, Spa and Hot Tub Code, 7/28/92.

CID-MB-NMP&M 91-1, 1991 New Mexico Plumbing and Mechanical Code, 7/7/92.

History of Repealed Material: 14 NMAC 9.2, 1997 New Mexico Plumbing and Mechanical Code (filed 10/30/98), repealed 7/1/04.

14.9.2 NMAC, 2003 New Mexico Mechanical Code (filed 5/27/04), repealed 1/1/08.

Other History:

CID-MB-NMP&M 91-1, 1991 New Mexico Plumbing and Mechanical Code, (filed 7/7/92), replaced by 14 NMAC 9.2, 1997 New Mexico Plumbing and Mechanical Code, effective 12-31-98.

14 NMAC 9.2, 1997 New Mexico Plumbing and Mechanical Code (filed 10-30-98) (that applicable portion) replaced by 14.9.2 NMAC, 2003 New Mexico Mechanical Code, effective 7/1/04.

14.9.2 NMAC, 2003 New Mexico Mechanical Code (filed 5/27/04) replaced by 14.9.2 NMAC, 2006 New Mexico Mechanical Code, effective 1/1/08.

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