

1.1 **Department of Labor and Industry**

1.2 **Adopted Permanent Rules Updating the Commercial Energy Code**

1.3 **1323.0010 INCORPORATION BY REFERENCE OF ASHRAE STANDARD 90.1.**

1.4 Subpart 1. **General.** Sections 1 to 12, Normative Appendix A, Normative Appendix  
1.5 C, and Normative Appendix G of the 2019 edition of ANSI/ASHRAE/IES Standard 90.1  
1.6 Energy Standard for Buildings Except Low-Rise Residential Buildings (ASHRAE 90.1)  
1.7 and Addendums a, c, d, g, h, k, l, q, r, w, af, ~~ed~~, cr, da, and db, as promulgated by the  
1.8 American Society of Heating, Refrigerating and Air-Conditioning Engineers, 1791 Tullie  
1.9 Circle NE, Atlanta, GA 30329, are incorporated by reference and made part of the Minnesota  
1.10 State Building Code except as qualified by the applicable provisions in Minnesota Rules,  
1.11 chapter 1300, and as amended in this rule chapter. Portions of this publication reproduce  
1.12 excerpts from ASHRAE 90.1, American Society of Heating, Refrigerating and  
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1.14 rights reserved. ASHRAE 90.1 is not subject to frequent change, and a copy of ASHRAE  
1.15 90.1, with amendments for use in Minnesota, is available in the office of the commissioner  
1.16 of labor and industry.

1.17 Subp. 2. **Mandatory sections.** ASHRAE 90.1 sections 1 to 12, Normative Appendix  
1.18 A, Normative Appendix C, and Normative Appendix G shall be administered by any  
1.19 municipality that has adopted the code, except as qualified by the applicable provisions in  
1.20 Minnesota Rules, chapter 1300, and as amended by this rule chapter. The following addenda  
1.21 to ASHRAE 90.1 are incorporated by reference, as amended in this rules chapter: Addendum  
1.22 a, Addendum c, Addendum d, Addendum g, Addendum h, Addendum k, Addendum l,  
1.23 Addendum q, Addendum r, Addendum w, Addendum af, ~~Addendum ed~~, Addendum cr,  
1.24 Addendum da, and Addendum db.

1.25 Subp. 3. [See repealer.]

2.1 **1323.0020 REFERENCES TO OTHER CODES.**

2.2 Subpart 1. **General.** References to the building code or applicable code in this code  
2.3 mean the Minnesota State Building Code as described in Minnesota Rules, part 1300.0050.

2.4 Subp. 2. [See repealer.]

2.5 Subp. 3. [See repealer.]

2.6 Subp. 4. [See repealer.]

2.7 Subp. 5. [See repealer.]

2.8 Subp. 6. [See repealer.]

2.9 Subp. 7. [See repealer.]

2.10 Subp. 8. [See repealer.]

2.11 Subp. 9. [See repealer.]

2.12 Subp. 10. [See repealer.]

2.13 Subp. 11. [See repealer.]

2.14 **1323.0210 SECTION 2, SCOPE.**

2.15 Subpart 1. **ASHRAE 90.1 section 2.1.** ASHRAE 90.1 section 2.1 is amended to read  
2.16 as follows:

2.17 2.1 This standard provides:

2.18 a. minimum energy-efficient requirements for the design and construction, and a  
2.19 plan for operation and maintenance of:

2.20 1. new buildings and their systems;

2.21 2. new portions of buildings and their systems;

2.22 3. new systems and equipment in existing buildings;

- 3.1 4. new equipment or building systems specifically identified in the standard
- 3.2 that are part of industrial or manufacturing processes;
- 3.3 5. all historical buildings as defined in Minnesota Rules, part 1300.0070,
- 3.4 subpart 12a;
- 3.5 6. alterations to existing buildings; and
- 3.6 7. existing buildings undergoing a change of occupancy; and
- 3.7 b. criteria for determining compliance with these requirements.

3.8 Subp. 2. **ASHRAE 90.1 section 2.2.** ASHRAE 90.1 section 2.2 is amended to read  
 3.9 as follows:

3.10 The provisions of this standard do not apply to:

- 3.11 a. IRC-1 Single-family dwellings, IRC-2 Two-family dwellings, IRC-3 Townhomes,
- 3.12 IRC-4 Utility buildings, residential multi-family structures of three stories or fewer
- 3.13 above grade, manufactured houses (mobile homes), and manufactured houses
- 3.14 (modular), or
- 3.15 b. buildings that use neither electricity nor fossil fuel.

3.16 **Exception to section 2.2:** Historical buildings that are classified as IRC-1, IRC-2,  
 3.17 IRC-3, or IRC-4 occupancies or are residential multi-family structures of three stories  
 3.18 or fewer above grade shall comply with this chapter or Minnesota Rules, chapter 1322.

3.19 Subp. 3. **ASHRAE 90.1 section 2.** ASHRAE 90.1 section 2 is amended by adding  
 3.20 two subsections to read as follows:

3.21 2.5 IRC-1 Single-family dwellings, IRC-2 Two-family dwellings, IRC-3 Townhomes,  
 3.22 IRC-4 Utility buildings, and the portions of buildings containing occupancy groups  
 3.23 I-1, R-1, R-2, R-3, and R-4 where the entire composite building structure is three or  
 3.24 fewer stories above grade shall comply with Minnesota Rules, chapter 1322.

4.1 2.6 Where a building contains multiple occupancy groups and portions of the building  
4.2 are required to comply with Minnesota Rules, chapter 1322, those portions shall comply  
4.3 with Minnesota Rules, chapter 1322, and the remainder of the building shall comply  
4.4 with this rules chapter.

4.5 **1323.0310 SECTION 3.1, GENERAL.**

4.6 Subpart 1. **ASHRAE 90.1 section 3.1 General.** ASHRAE 90.1 section 3.1 is amended  
4.7 to read as follows:

4.8 **3.1 General.** Certain terms, abbreviations, and acronyms are defined in this section for  
4.9 the purposes of this standard. When the tense or plurality of the term is different than  
4.10 the defined term, the definition still applies. Where terms are not defined through the  
4.11 methods authorized by this chapter, the Merriam-Webster Collegiate Dictionary,  
4.12 available at [www.m-w.com](http://www.m-w.com), shall be considered as providing ordinarily accepted  
4.13 meanings. The dictionary is incorporated by reference, is subject to frequent change,  
4.14 and is available through the Minitex interlibrary loan system.

4.15 Subp. 2. **ASHRAE 90.1 section 3.1.1 Terms defined in other codes.** ASHRAE 90.1  
4.16 section 3.1 is amended by adding a subsection to read as follows:

4.17 **3.1.1 Terms defined in other codes.** Where terms are not defined in this standard and  
4.18 are defined in the other chapters of the Minnesota State Building Code, such terms  
4.19 shall have the meanings ascribed to them as in those codes.

4.20 **1323.0320 SECTION 3.2, DEFINITIONS.**

4.21 A. ASHRAE 90.1 section 3.2 is amended by modifying the following definition  
4.22 to read as follows:

4.23 **COMPUTER ROOM.** "Computer room" means a room whose primary function is  
4.24 to house equipment for the processing and storage of electronic data and that has a design  
4.25 electronic data equipment power density of greater than 20 watts per square foot (20 watts

5.1 per 0.092 m<sup>2</sup>) of conditioned floor area or a connected design electronic data equipment  
5.2 load of greater than 10 kW.

5.3 B. ASHRAE 90.1 section 3.2 is amended by adding the following definitions:

5.4 **APPROVED.** "Approved" means approval by the building official, pursuant to the  
5.5 Minnesota State Building Code, by reason of:

5.6 1. inspection, investigation, or testing;

5.7 2. accepted principles;

5.8 3. computer simulations;

5.9 4. research reports; or

5.10 5. testing performed by either a licensed engineer or by a locally or nationally recognized  
5.11 testing laboratory.

5.12 **COMMERCIAL PARKING FACILITY.** "Commercial parking facility" means a  
5.13 building or structure intended for containment of motor vehicles where the parking is related  
5.14 to or associated with commerce, defined as the activity of buying and selling goods and  
5.15 services, which may include the parking itself.

5.16 **STANDARD.** "This standard" means the Minnesota Commercial Energy Code,  
5.17 Minnesota Rules, chapter 1323.

5.18 **1323.0411 SECTION 4.1.1, SCOPE.**

5.19 **ASHRAE 90.1 section 4.1.1.6 Mixed occupancy.** ASHRAE 90.1 section 4.1.1 is  
5.20 amended by adding a new subsection to read as follows:

5.21 **4.1.1.6 Mixed occupancy.** Each occupancy in a building more than three stories above  
5.22 grade will be considered separately and meet the applicable provisions of this standard.

5.23 Where a building is three stories or less in height and includes both I-1, R-1, R-2, R-3,

6.1 or R-4 occupancies and other occupancies, the I-1, R-1, R-2, R-3, or R-4 occupancies  
6.2 shall comply with Minnesota Rules, chapter 1322, and the other occupancies shall meet  
6.3 the applicable provisions of this standard. For the purposes of this section, fire walls  
6.4 and horizontal assemblies shall not define separate buildings.

6.5 **1323.0420 SECTION 4.2, COMPLIANCE.**

6.6 Subpart 1. **ASHRAE 90.1 section 4.2.1.3 Alterations of existing buildings.** ASHRAE  
6.7 90.1 section 4.2.1.3 is amended to read as follows:

6.8 **4.2.1.3 Alterations of existing buildings.** Alterations of an existing building, building  
6.9 system, or portion thereof shall conform to this standard as related to new construction  
6.10 without requiring the unaltered portion(s) of the existing building or building system  
6.11 to comply with this standard. Alterations shall not create an unsafe or hazardous  
6.12 condition or overload existing building systems. Alterations of existing buildings shall  
6.13 comply with the provisions of Sections 4.2.2 through 4.2.5 and one of the following:

6.14 a. Section 5, "Building Envelope"; Section 6, "Heating, Ventilating, and Air  
6.15 Conditioning"; Section 7, "Service Water Heating"; Section 8, "Power"; Section  
6.16 9, "Lighting"; and Section 10, "Other Equipment";

6.17 b. Section 11, "Energy Cost Budget Method"; or

6.18 c. Normative Appendix G, "Performance Rating Method" in accordance with  
6.19 Section 4.2.1.1.

6.20 **Exception to Section 4.2.1.3:** A historical building shall comply with this standard to  
6.21 the greatest extent possible without requiring alteration of elements or features  
6.22 determined to be historic by the historic authority having jurisdiction. Exempted  
6.23 components, elements, or systems shall be specifically identified on the construction  
6.24 documents by the designer as historic and exempt.

7.1 Subp. 2. **ASHRAE 90.1 section 4.2.1.4 Change of occupancy or use.** ASHRAE  
7.2 90.1 section 4.2.1.4 is added to read as follows:

7.3 **4.2.1.4 Change of occupancy or use.** All spaces undergoing a change in occupancy  
7.4 shall comply with lighting requirements of section 9 as for new construction. Spaces  
7.5 undergoing a change in occupancy that result in an increase in demand for either fossil  
7.6 fuel or electrical energy shall comply with this standard.

7.7 **Exceptions to Section 4.2.1.4:**

7.8 1. A historical building shall comply with this standard to the greatest extent possible  
7.9 without requiring alteration of elements or features determined to be historic by the  
7.10 historic authority having jurisdiction. Exempted components, elements, or systems  
7.11 shall be specifically identified by the designer as historic and exempt.

7.12 2. Change of occupancy requirements associated with a tenant space within a  
7.13 multi-tenant building shall not be required to modify equipment common to multiple  
7.14 tenants or building envelope located beyond the tenant space.

7.15 Subp. 3. **ASHRAE 90.1 section 4.2.5.1.1 Information on building permit**  
7.16 **application.** ASHRAE 90.1 section 4.2.5.1.1 is amended to read as follows:

7.17 **4.2.5.1.1 Information on construction documents.** The following information shall  
7.18 be included on the construction documents as part of the building permit application:

7.19 a. for systems that are required to comply with Section 4.2.5.1, the construction  
7.20 documents shall identify verification and testing providers;

7.21 b. verification and testing providers shall review the construction documents to  
7.22 verify that the relevant sensor locations, devices, and control sequences are properly  
7.23 specified; performance and testing criteria are included; and equipment to be tested  
7.24 is accessible for testing and maintenance;

- 8.1 c. functional performance testing and verification processes and system performance  
8.2 requirements shall be incorporated into the construction documents;
- 8.3 d. energy code compliance path (Prescriptive, Energy Cost Budget Method,  
8.4 Normative Appendix G);
- 8.5 e. insulation materials and their R-values;
- 8.6 f. fenestration U-factors and SHGCs;
- 8.7 g. area-weighted U-factor and SHGC calculations;
- 8.8 h. mechanical system design criteria;
- 8.9 i. mechanical and service water heating system and equipment types, sizes, and  
8.10 efficiencies;
- 8.11 j. economizer description; equipment and systems controls;
- 8.12 k. fan motor brake horsepower for fan motors one horsepower (hp) or larger;
- 8.13 l. fan motor horsepower and controls;
- 8.14 m. duct sealing, duct sizing, duct and pipe insulation and location, terminal air or  
8.15 water design flow rates;
- 8.16 n. electrical distribution diagram(s);
- 8.17 o. lighting fixture schedule with wattage and control narrative;
- 8.18 p. locations of daylight zones on plans and provisions for functional testing of  
8.19 lighting controls;
- 8.20 q. air sealing details clearly delineating the air barrier location and showing  
8.21 continuity between roof, wall, foundation, around frames and sleeves, and at other  
8.22 similar openings; and



9.1 r. additional details as required by the building official to determine whether the  
9.2 work proposed will conform to this standard.

9.3 **1323.0512 SECTION 5.1.2, SPACE CONDITIONING CATEGORIES.**

9.4 **ASHRAE 90.1 section 5.1.2.3.** The exception to ASHRAE 90.1 section 5.1.2.3 is  
9.5 amended to read as follows:

9.6 **Exception to 5.1.2.3:** A space may be designated as either a semiheated space or an  
9.7 unconditioned space if approved by the building official. Unconditioned and semiheated  
9.8 spaces shall not be approved if there are automatic fire sprinkler systems unless those  
9.9 systems are designed to operate in below freezing temperatures. Signs indicating the  
9.10 maximum Btu heating input for semiheated spaces that is permissible by this standard  
9.11 shall be posted near the main entry location of the semiheated space. Posted signs shall  
9.12 be of an approved legible permanent design and shall be maintained by the owner or  
9.13 the owner's authorizing agent.

9.14 **1323.0513 SECTION 5.1.3, ENVELOPE ALTERATIONS.**

9.15 Subpart 1. **ASHRAE 90.1 section 5.1.3.** ASHRAE 90.1 section 5.1.3 is amended by  
9.16 modifying exception 3 to read as follows:

9.17 3. Alterations to roof, wall, or floor cavities that are insulated to full depth with insulation  
9.18 having a minimum nominal value of R-3.0/inch and having either integral vapor retarder  
9.19 qualities or a membrane vapor retarder. The membrane vapor retarder shall prevent  
9.20 moisture from accumulating in the cavities and allow drying to the interior and shall  
9.21 be installed to separate the insulation from the conditioned space in accordance with  
9.22 the Minnesota Building Code.

9.23 Subp. 2. **ASHRAE 90.1 section 5.1.3.** ASHRAE 90.1 section 5.1.3 is amended by  
9.24 modifying exception 8 to read as follows:

10.1 8. Historical buildings undergoing renovations or a change of occupancy shall not be  
10.2 required to comply with this rules chapter for those portions or elements of the building  
10.3 determined by the historical authority having jurisdiction as contributing to the historic  
10.4 significance of the building and upon approval of the building official. Portions or  
10.5 components that can be modified to comply with this rules chapter without impacting  
10.6 the historic significance of the building shall be modified to comply to the greatest  
10.7 extent possible.

10.8 Subp. 3. **ASHRAE 90.1 section 5.1.3.** ASHRAE 90.1 section 5.1.3 is amended by  
10.9 adding exception 9 to read as follows:

10.10 9. Where insulation is provided above the roof deck, and the required R-value for a  
10.11 roof replacement cannot be provided because of existing structural capacity limitations  
10.12 or because of the thickness limitations that occur with the existing rooftop conditions,  
10.13 including heating, ventilation and air conditioning equipment curbs, low door or glazing  
10.14 heights, parapet heights, or proper roof flashing heights, the maximum insulation  
10.15 compatible with the available space and existing rooftop conditions shall be installed,  
10.16 as approved by the building official. New insulation shall have the highest R-value per  
10.17 inch available, and in no case shall the R-value of the roof insulation be reduced or the  
10.18 U-factor of the roof assembly be increased as part of the roof replacement.

10.19 **1323.0514 CLIMATE.**

10.20 **ASHRAE 90.1 section 5.1.4 Climate.** ASHRAE 90.1 section 5.1.4 is amended to read  
10.21 as follows:

10.22 **5.1.4 Climate.** The following counties are located in climate zone 7: Aitkin, Beltrami,  
10.23 Carlton, Cass, Clearwater, Cook, Crow Wing, Hubbard, Itasca, Kittson, Koochiching,  
10.24 Lake, Lake of the Woods, Mahnommen, Marshall, Norman, Pennington, Pine, Polk, Red  
10.25 Lake, Roseau, St. Louis, and Wadena. All other counties are located in climate zone  
10.26 6A.

11.1 **1323.0543 SECTION 5.4.3, AIR LEAKAGE.**

11.2 Subpart 1. **ASHRAE 90.1 section 5.4.3.1 Continuous air barrier.** ASHRAE 90.1  
11.3 section 5.4.3.1 is amended by deleting exception 1.

11.4 Subp. 2. **ASHRAE 90.1 section 5.4.3.1.1 Whole-building air leakage.** ASHRAE  
11.5 90.1 section 5.4.3.1.1 is amended by adding exception 4 to read as follows:

11.6 4. For buildings or portions of buildings enclosing Group R or Group I occupancies,  
11.7 the measured air leakage shall not exceed 0.30 cfm/ft<sup>2</sup> (1.5 L/s m<sup>2</sup>) of the testing unit  
11.8 enclosure area at a pressure differential of 0.2 inch water gauge (50 Pa). Where multiple  
11.9 dwelling units or sleeping units or other occupiable conditioned spaces are contained  
11.10 within one building thermal envelope, each unit shall be considered an individual testing  
11.11 unit, and the building air leakage shall be the weighted average of all testing unit results,  
11.12 weighted by each testing unit's enclosure area. Units shall be tested separately with an  
11.13 unguarded blower door test as follows:

11.14 a. Where buildings have fewer than eight testing units, each testing unit shall be  
11.15 tested.

11.16 b. For buildings with eight or more testing units, the greater of seven units or 20  
11.17 percent of the testing units in the building shall be tested, including a top floor  
11.18 unit, a ground floor unit, and a unit with the largest testing unit enclosure area.

11.19 For each tested unit that exceeds the maximum air leakage rate, an additional two  
11.20 units shall be tested, including a mixture of testing unit types and locations.

11.21 **1323.0553 SECTION 5.5.3, OPAQUE AREAS.**

11.22 Subpart 1. **ASHRAE 90.1 section 5.5.3.1 Roof insulation.** ASHRAE 90.1 section  
11.23 5.5.3.1 is amended to read as follows:

11.24 **5.5.3.1 Roof insulation.** All roofs shall comply with the insulation values specified in  
11.25 Tables 5.5-0 through 5.5-8. Skylight curbs, mechanical curbs, and other roof curbs

12.1 shall be insulated to the level of roofs with insulation entirely above deck or R-10,  
12.2 whichever is less.

12.3 **Exception:** Historical buildings with roof slopes two units vertical in 12 units horizontal  
12.4 (2:12) or less.

12.5 (Subsection 5.5.3.1.1 remains unchanged.)

12.6 Subp. 2. **ASHRAE 90.1 section 5.5.3.3 Below-grade wall insulation.** ASHRAE  
12.7 90.1 section 5.5.3.3 is amended to read as follows:

12.8 **5.5.3.3 Below-grade wall insulation.** Below-grade walls shall have a rated R-value  
12.9 of insulation no less than the insulation values specified in Tables 5.5-0 through 5.5-8.  
12.10 Walls shall be insulated on the exterior side of the wall or integral to the wall.

12.11 **1323.0611 SECTION 6.1.1, SCOPING FOR HEATING, VENTILATING, AND AIR**  
12.12 **CONDITIONING.**

12.13 Subpart 1. **ASHRAE 90.1 section 6.1.1.3.6 Rooftop HVACR.** ASHRAE 90.1 section  
12.14 6.1.1.3 is amended by adding a new subsection to read as follows:

12.15 **6.1.1.3.6 Rooftop HVACR.** Unless technically infeasible, new and replacement rooftop  
12.16 equipment shall be provided with new insulated curbs in accordance with Section  
12.17 5.5.3.1. The replacement curbs shall be of sufficient height to permit the installation  
12.18 of insulation that complies with Tables 5.5-6 and 5.5-7 when roof replacement occurs.

12.19 Subp. 2. **ASHRAE 90.1 section 6.1.1.4 Heating of commercial parking facilities**  
12.20 **prohibited.** ASHRAE 90.1 section 6.1.1 is amended by adding a new subsection to read  
12.21 as follows:

12.22 **6.1.1.4 Heating of enclosed commercial parking facilities prohibited.** Heating of  
12.23 enclosed commercial parking facilities is prohibited in accordance with Minnesota  
12.24 Statutes, section 216C.20, subdivision 3.

13.1 **Exceptions:**

13.2 1. Parking open to the public that is accessory to private parking where the parking  
13.3 open to the public is less than ten percent of the total number of spaces.

13.4 2. Vehicle showrooms for vehicle sales.

13.5 Subp. 3. **ASHRAE 90.1 section 6.1.1.5 Prohibition of once-through water use**  
13.6 **permits.** ASHRAE 90.1 section 6.1.1 is amended by adding a new subsection to read as  
13.7 follows:

13.8 **6.1.1.5 Prohibition of once-through water use permits.** Once-through water use  
13.9 permits are restricted in accordance with Minnesota Statutes, section 103G.271,  
13.10 subdivision 5.

13.11 **1323.0642 SECTION 6.4.2, CALCULATIONS.**

13.12 Subpart 1. **6.4.2.1.1 Climatic data design conditions.** ASHRAE 90.1 section 6.4.2.1  
13.13 is amended by adding a subsection to read as follows:

13.14 **6.4.2.1.1 Climatic data design conditions.** Climatic data design conditions for the  
13.15 calculation of heating and cooling loads shall be determined by using either item 1 or  
13.16 2:

13.17 1. the climatic data in Table 6.4.2.1 for the city where the building is located or  
13.18 the nearest city listed in Table 6.4.2.1; or

13.19 2. the weather data published as a part of ASHRAE Standard 169-2013 at  
13.20 [www.ASHRAE-meteo.info](http://www.ASHRAE-meteo.info). The weather data for the city where the building is  
13.21 located or for the nearest available city shall be used. The data shall be used as  
13.22 follows:

13.23 (a) design temperatures shall be rounded to the nearest whole number;

- 14.1 (b) winter design conditions shall be the mean extreme annual temperature;
- 14.2 and
- 14.3 (c) summer conditions shall be the one percent annual cooling design
- 14.4 conditions.

14.5 Subp. 2. **Table 6.4.2.1. Climatic data design conditions.** ASHRAE 90.1 section  
 14.6 6.4.2.1 is amended by adding a table to read as follows:

**TABLE 6.4.2.1  
 CLIMATIC DATA DESIGN CONDITIONS**

14.9 City	14.10 Winter Design db °F	14.11 Summer db °F/coincident wb °F
14.12 Aitkin	-28	82/72
14.13 Albert Lea	-19	86/72
14.14 Alexandria	-23	85/70
14.15 Bemidji	-30	82/67
14.16 Brainerd	-27	85/69
14.17 Cloquet	-24	82/68
14.18 Crookston	-28	84/70
14.19 Duluth	-23	81/67
14.20 Ely	-34	82/67
14.21 Eveleth	-31	82/67
14.22 Faribault	-21	88/73
14.23 Fergus Falls	-26	85/70
14.24 Grand Marais	-19	73/62
14.25 Grand Rapids	-25	82/67
14.26 Hibbing	-31	82/68
14.27 International Falls	-35	82/67
14.28 Litchfield	-20	86/72
Little Falls	-26	86/70

15.1	Mankato	-16	86/72
15.2	Minneapolis/St. Paul	-17	88/72
15.3	Montevideo	-19	88/73
15.4	Mora	-24	86/70
15.5	Morris	-23	86/72
15.6	New Ulm	-19	88/73
15.7	Owatonna	-19	86/72
15.8	Pequot Lakes	-31	85/68
15.9	Pipestone	-19	86/73
15.10	Redwood Falls	-19	88/73
15.11	Rochester	-19	85/72
15.12	Roseau	-31	84/72
15.13	St. Cloud	-24	86/71
15.14	Silver Bay	-28	82/66
15.15	Thief River Falls	-27	82/68
15.16	Tofte	-14	75/61
15.17	Virginia	-31	82/67
15.18	Warroad	-32	82/70
15.19	Wheaton	-23	86/72
15.20	Willmar	-22	86/72
15.21	Winona	-18	88/73
15.22	Worthington	-16	86/71

15.23 Db = dry bulb temperature, degrees Fahrenheit

15.24 Wb = wet bulb temperature, degrees Fahrenheit

15.25 **1323.0643 SECTION 6.4.3, CONTROLS AND DIAGNOSTICS.**

15.26 Subpart 1. **ASHRAE 90.1 section 6.4.3.4.2 Ventilation system control.** ASHRAE

15.27 90.1 section 6.4.3.4.2 is amended by modifying the exception 1 to read as follows:

15.28 1. [Reserved].

16.1 Subp. 2. **ASHRAE 90.1 section 6.4.3.4.2 Ventilation system control.** ASHRAE  
16.2 90.1 section 6.4.3.4.2 is amended by modifying the exception 2 to read as follows:

16.3 2. Nonmotorized dampers are acceptable in systems with a design outdoor air intake,  
16.4 relief, or exhaust capacity of 300 cfm or less. Nonmotorized dampers for outdoor air  
16.5 intakes must be protected from direct exposure to wind.

16.6 **1323.0644 SECTION 6.4.4, HVAC SYSTEM CONSTRUCTION AND INSULATION.**

16.7 **ASHRAE 90.1 section 6.4.4.1.2.** ASHRAE 90.1 section 6.4.4.1.2 is amended by  
16.8 deleting item 2 from the list of exceptions.

16.9 **1323.0656 ENERGY RECOVERY.**

16.10 Subpart 1. **ASHRAE 90.1 section 6.5.6.1.1 Nontransient dwelling units.** ASHRAE  
16.11 90.1 section 6.5.6.1.1 is amended by modifying exception 2 to read as follows:

16.12 2. Nontransient dwelling units with no more than 750 ft<sup>2</sup> of conditioned floor area.

16.13 Subp. 2. **ASHRAE 90.1 section 6.5.6.1.2 Spaces other than nontransient dwelling**  
16.14 **units.** ASHRAE 90.1 section 6.5.6.1.2 is amended to read as follows:

16.15 **6.5.6.1.2 Spaces Other than Nontransient Dwelling Units.** Each fan system serving  
16.16 spaces other than nontransient dwelling units shall have an energy recovery system  
16.17 where the design supply fan airflow rate exceeds the value listed in Table 6.5.6.1.2,  
16.18 based on the climate zone and percentage of outdoor air at design airflow conditions.

16.19 **Exceptions:**

16.20 1. Laboratory systems meeting Section 6.5.7.3.

16.21 2. Systems serving spaces that are not cooled and that are heated to less than 60°F.

16.22 3. Heating energy recovery where more than 60 percent of the outdoor air heating  
16.23 energy is provided from site-recovered energy or site-solar energy in Climate

16.24 Zones 5 through 8.



17.1 4. Enthalpy recovery ratio requirements at cooling design condition in Climate  
17.2 Zones 3C, 4C, 5B, 5C, 6B, 7, and 8.

17.3 5. Where the sum of the airflow rates exhausted and relieved within 20 feet of  
17.4 each other is less than 75 percent of the design outdoor airflow rate, excluding  
17.5 exhaust air that is:

17.6 a. used for another energy recovery system;

17.7 b. not allowed by ASHRAE/ASHE Standard 170 for use in energy recovery  
17.8 systems with leakage potential; or

17.9 c. of Class 4 as defined in ASHRAE Standard 62.1.

17.10 6. Systems expected to operate less than 20 hours per week at the outdoor air  
17.11 percentage covered by Table 6.5.6.1.2.

17.12 7. Indoor pool dehumidifiers meeting Section 6.5.6.4.

17.13 **6.5.6.1.2.1 Minimum Enthalpy Recovery Ratio.** Energy recovery systems required  
17.14 by this section shall result in an enthalpy recovery ratio of at least 50 percent. A 50  
17.15 percent enthalpy recovery ratio shall mean a change in the enthalpy of the outdoor air  
17.16 supply equal to 50 percent of the difference between the outdoor air and entering exhaust  
17.17 air enthalpies at design conditions. The energy recovery system shall provide the  
17.18 required enthalpy recovery ratio at both heating and cooling design conditions unless  
17.19 one mode is not required for the climate zone by Exception 6.5.6.1.2.2.

17.20 **6.5.6.1.2.2 Provision for Air Economizer or Bypass Operation.** Provision shall be  
17.21 made for both outdoor air and exhaust air to bypass or control the energy recovery  
17.22 system to enable economizer operation as required by Section 6.5.1.1. The bypass or  
17.23 control shall meet the following criteria:

18.1 a. For energy recovery systems where the transfer of energy cannot be stopped,  
 18.2 bypass provision shall prevent the total airflow rate of either outdoor air or exhaust  
 18.3 air through the energy recovery exchanger from exceeding 10 percent of the full  
 18.4 design airflow rate.

18.5 b. The pressure drop of the outdoor air through the energy recovery exchanger  
 18.6 shall not exceed 0.4 inch of water. The pressure drop of the exhaust air through  
 18.7 the energy recovery exchanger shall not exceed 0.4 inch of water.

18.8 **Exception to 6.5.6.1.2.2:** Energy recovery systems with 80 percent or more outdoor  
 18.9 air at full design airflow rate and not exceeding 10,000 cfm.

18.10 Subp. 3. **Table 6.5.6.1.2.** ASHRAE 90.1 Table 6.5.6.1.2-1 and Table 6.5.6.1.2-2 are  
 18.11 deleted and replaced with the following:

18.12 **Table 6.5.6.1.2**

18.13 **Exhaust Air Energy Recovery Requirements for Ventilation Systems**

18.14 Percent (%) Outdoor Air At Full Design Airflow Rate

18.15	<u>Climate</u>	<u>≥10%</u>	<u>≥20%</u>	<u>≥30%</u>	<u>≥40%</u>	<u>≥50%</u>	<u>≥60%</u>	<u>≥ 70%</u>	<u>≥80%</u>
18.16	<u>Zone</u>	<u>and</u>	<u>and</u>	<u>and</u>	<u>and</u>	<u>and</u>	<u>and</u>	<u>and</u>	
18.17		<u>&lt;20%</u>	<u>&lt;30%</u>	<u>&lt;40%</u>	<u>&lt;50%</u>	<u>&lt;60%</u>	<u>&lt;70%</u>	<u>&lt;80%</u>	

18.18 Design Supply Fan Airflow Rate (cfm)

18.19	<u>6A</u>	<u>NR</u>	<u>≥16,000</u>	<u>≥5,500</u>	<u>≥4,500</u>	<u>≥3,500</u>	<u>≥2,000</u>	<u>≥1,000</u>	<u>≥120</u>
18.20	<u>7</u>	<u>NR</u>	<u>≥4,000</u>	<u>≥2,500</u>	<u>≥1,000</u>	<u>≥140</u>	<u>≥120</u>	<u>≥100</u>	<u>≥80</u>

18.21 NR= Not required.

18.22 **1323.0680 SECTION 6.8, MINIMUM EQUIPMENT EFFICIENCY TABLES.**

18.23 Subpart 1. **Table 6.8.2 Minimum duct insulation R-Value.** ASHRAE 90.1 Table  
 18.24 6.8.2 is deleted and replaced with the following:

18.25 **TABLE 6.8.2**

18.26 **Minimum Required Duct and Plenum Insulation**

19.1	<b>Ducts for Other</b>			<b>Exhaust Duct and</b>
19.2	<b>Than Dwelling</b>	<b>Supply Duct</b>	<b>Return Duct</b>	<b>Relief Duct</b>
19.3	<b>Units<sup>a,b</sup></b>	<b>Requirements<sup>c,d</sup></b>	<b>Requirements<sup>c,d</sup></b>	<b>Requirements<sup>c,d,e,g</sup></b>
19.4	Exterior of building	R-12, V and W	R-12, V and W	R-12, V and W
19.5	Attics, garages, and			
19.6	ventilated crawl			
19.7	spaces	R-12 and V	R-12 and V	R-6 and V
19.8	TD greater than 40°F	R-5 and V	None	R-5 and V
19.9	TD greater than 15°F			
19.10	and less than or equal			
19.11	to 40°F	R-3.3 and V	None	R-3.3 and V
19.12	Within concrete slab			
19.13	or within ground	R-3.5 and V	R-3.5 and V	None
19.14	Within conditioned			
19.15	spaces	None <sup>f</sup>	None	None
19.16	TD less than or equal			
19.17	to 15°F	None	None	None

19.18	<b><u>Ducts for Dwelling Units<sup>a</sup></u></b>	<b><u>Requirements<sup>c,d</sup></u></b>
19.19	<u>Exterior of building</u>	<u>R-12, V and W</u>
19.20	<u>Attics, garages, and ventilated crawl spaces</u>	
19.21	<u>(except exhaust ducts)</u>	<u>R-12 and V</u>
19.22	<u>Exhaust ducts in attics, garages, and</u>	
19.23	<u>ventilated crawl spaces</u>	<u>R-3.3 and V</u>
19.24	<u>Outdoor air intakes within conditioned spaces</u>	<u>R-3.3 and V</u>
19.25	<u>Exhaust ducts within conditioned spaces<sup>e</sup></u>	<u>R-3.3 and V</u>
19.26	<u>Within concrete slab or within ground</u>	<u>R-3.5 and V</u>
19.27	<u>Within conditioned spaces</u>	<u>None</u>

19.28  $^{\circ}\text{C} = [(^{\circ}\text{F}) - 32]/1.8$

19.29 a. Ducts located within the building thermal envelope shall be located completely on  
19.30 the conditioned side of the air barrier.

- 20.1 b. TD = Design temperature difference between the air in the duct and the ambient  
20.2 temperature outside of the duct, unless the duct type and location are specifically  
20.3 identified above.
- 20.4 c. V = Vapor retarder required in accordance with Minnesota Rules, chapter 1346.  
20.5 When a vapor retarder is required, duct insulation required by this section shall be  
20.6 installed without respect to other building envelope insulation.
- 20.7 d. W = Approved weatherproof barrier.
- 20.8 e. Insulation is only required in the conditioned space for a distance of three feet (914  
20.9 mm) from the exterior or unconditioned space.
- 20.10 f. If the temperature rise is greater than 3°F from the supply air connection of the air  
20.11 handling unit to the furthest outlet, duct insulation shall be required for the entire length  
20.12 or for sufficient length to limit the temperature rise to 3°F.
- 20.13 g. Insulation is not required on the exterior if low leak dampers are installed at roof or  
20.14 wall line or the exhaust is designed to be operated continuously.

20.15 Subp. 2. **ASHRAE 90.1 Table 6.8.3-1 Minimum piping insulation thickness heating**  
20.16 **and hot-water systems.** ASHRAE 90.1 Table 6.8.3-1 is amended to add footnote "f" to  
20.17 read as follows:

- 20.18 f. Insulation requirements do not apply to those sections of piping used as the radiant  
20.19 heat source for radiant heating systems.

20.20 **1323.0711 SECTION 7.1.1, SERVICE WATER-HEATING SCOPE.**

20.21 **ASHRAE 90.1 section 7.1.1.3 Alterations to existing buildings.** ASHRAE 90.1  
20.22 section 7.1.1.3 is amended to read as follows:

- 20.23 **7.1.1.3 Alterations to existing buildings.** Building service water-heating equipment  
20.24 installed as a direct replacement for existing building service water-heating equipment

21.1 shall comply with the requirements of Section 7 applicable to the equipment being  
21.2 replaced. New piping, replacement piping, and existing piping that is not undergoing  
21.3 replacement that is accessible within the work area shall comply with Section 7.4.3.  
21.4 Where alterations include replacement of storage water heaters, then vertical pipe risers  
21.5 shall comply with Section 7.4.6.

21.6 **1323.0753 SECTION 7.5.3, BUILDINGS WITH HIGH-CAPACITY SERVICE**  
21.7 **WATER HEATING SYSTEMS.**

21.8 **ASHRAE 90.1 section 7.5.3.** ASHRAE 90.1 section 7.5.3 is amended by modifying  
21.9 exception 1 to read as follows:

21.10 1. Where at least 50 percent of the annual service water-heating requirement is provided  
21.11 by site-solar energy or site-recovered energy. The site-solar energy or site-recovered  
21.12 energy used for compliance with this exception cannot be used for compliance with  
21.13 any other section of this standard.

21.14 **1323.0842 SECTION 8.4.2, AUTOMATIC RECEPTACLE CONTROL.**

21.15 **ASHRAE 90.1 section 8.4.2 Automatic receptacle control.** ASHRAE 90.1 section  
21.16 8.4.2 is deleted in its entirety.

21.17 **1323.0940 SECTION 9.4, MANDATORY LIGHTING PROVISIONS.**

21.18 **ASHRAE 90.1 section 9.4 Mandatory provisions.** ASHRAE 90.1 section 9.4 is  
21.19 amended by adding a section to read as follows:

21.20 **9.4.4 Parking lot lighting.** Parking lot lighting is regulated by the Minnesota  
21.21 Department of Transportation in Minnesota Rules, chapter 8885.

21.22 **REPEALER.** Minnesota Rules, parts 1323.0010, subpart 3; 1323.0020, subparts 2, 3, 4,  
21.23 5, 6, 7, 8, 9, 10, and 11; 1323.0100, subparts 1, 2, 3, 4, 5, 6, 7, 8, and 10; 1323.0201;  
21.24 1323.0202; 1323.0303; 1323.0401; 1323.0402, subpart 1; 1323.0403, subparts 1, 2, 2a, 3,

- 22.1 4, 5, 6, 7, 8, 9, 10, 11a, 12a, 13, 14, and 15; 1323.0404; and 1323.0408, subpart 1, are
- 22.2 repealed.