

Minnesota Department of Labor and Industry

Construction Codes and Licensing Division

STATEMENT OF NEED AND REASONABLENESS

Proposed Amendment to Rules Governing the Minnesota Residential Energy Code, Proposed as Minnesota Rules, Chapter 1322; and Repeal of Minnesota Rules, Chapters 7670, 7672 and 7674.

INTRODUCTION

The Commissioner of the Minnesota Department of Labor and Industry proposes to amend Minnesota's current residential energy code rules by adopting chapter 11 of the 2006 International Residential Code, by reference and as amended, as Minnesota Rules, Chapter 1322. The proposed rules address the energy efficiency requirements pertaining to residential buildings governed by Minnesota Rules, chapter 1309, which amends the 2006 International Residential Code (hereinafter the "IRC"), and residential buildings that are built in accordance with Minnesota Rules, Chapter 1305, which amends the 2006 International Building Code (hereinafter the "IBC").

The International Code Council (hereinafter "ICC") promulgates the IRC and IBC. The ICC routinely reviews, modifies, and updates the IRC and IBC to provide the most current and complete criteria relating to the design and installation of residential building systems. Because the 2006 IRC, chapter 11, offers the most current set of criteria pertaining to energy efficiency, the Minnesota Department of Labor and Industry proposes to incorporate the 2006 IRC, chapter 11, with amendments where necessary, as administrative rule chapter 1322.

Currently, Minnesota's building code provisions pertaining to energy and residential buildings constructed to Minn. R. ch. 1305 and 1309 are contained in Minnesota Rules, Chapters 7670, 7672, and 7674. The location of energy code rules within three rule chapters has made finding applicable rules difficult to locate, which has caused confusion to those complying with the rules and to those administering and enforcing the rules.

In the development and drafting of these proposed rules, the Department's Construction Codes and Licensing Division utilized an advisory committee comprised of a diverse membership from industry, state agencies, and builders' groups from Minnesota, manufacturers, suppliers, educators, and others. This committee met more than 40 times over approximately three and one-half years to assist the Division. The committee agreed upon language to recommend to the Division, which was, along with other information and comments, reviewed by the Division to create the final proposed rule language.

The Division and the committee also relied on research and analysis¹ addressing air

¹ Minn. Stat. §16B.6175.

quality, building durability, moisture, enforcement, enforceability cost benefit, and liability to develop proposed rules that are the best possible rules for climactic conditions in Minnesota. The research and analysis was performed in conjunction with the University of Minnesota, the Builders Association of Minnesota, and various state agencies such as the Department of Health and the Department of Commerce.

These rules also contain Appendix F, Radon Control Methods, as amended, in response to the legislative requirement that the Commissioner adopt rules for radon control as part of the State Building Code.²

ALTERNATIVE FORMAT

Upon request, this Statement of Need and Reasonableness can be made available in an alternative format, such as large print, Braille, or cassette tape. To make a request, contact Carrie Rohling at the Department of Labor and Industry, 443 Lafayette Road North, Third Floor, St. Paul, MN 55155, telephone (651) 284-5217, fax, (651) 284-5725, or email to dli.rules@state.mn.us. TTY users may call the Department at (651) 297-4198.

STATUTORY AUTHORITY

The authority to adopt the energy portion of the Minnesota State Building Code transferred to the Department of Administration on July 1, 1999.³ Then, pursuant to the Department of Administration's Reorganization Order No. 193, dated April 4, 2005, the responsibilities of the Department of Administration in relation to State Building Codes and Standards as set forth in Minnesota Statutes, section 16B.59 through 16B.76 (2004) were transferred to the Department of Labor and Industry.⁴ The Department's statutory authority to adopt the rules is set forth in Minnesota Statutes, sections 16B.59, 16B.61, 16B.64, and 32B.02.

Minnesota Statutes, section 16B.59, states in pertinent part:

The State Building Code governs the construction, reconstruction, alteration, and repair of buildings and other structures to which the code is applicable. The commissioner shall administer and amend a state code of building construction which will provide basic and uniform performance standards, establish reasonable safeguards for health, safety, welfare, comfort, and security of the residents of this state and provide for the use of modern methods, devices, materials, and techniques which will in part tend to lower

² 2007 *Minn. Laws*, chapter 40, section 1

³ See, 1999 *Minn. Laws*, Chapter 135, Section 7, which states: "[TRANSFER.] While the energy portion of the state building code is developed by the commissioner of public service, adoption of the energy portion of the building code is transferred from the commissioner of public service to the commissioner of administration in consultation with the commissioner of public service in accordance with Minnesota Statutes, section 15.039, excluding subdivisions 6 and 7."

⁴ Reorganization Order No. 193 was effective upon filing with the Secretary of State on May 16, 2005, and shall remain in effect until amended, repealed, or superseded. For a copy of the reorganization order, please contact Carrie Rohling by email at dli.rules@state.mn.us, or phone to (651) 284-5217.

construction costs. The construction of buildings should be permitted at the least possible cost consistent with recognized standards of health and safety.

Minnesota Statutes, section 16B.61, subdivision 1, states in pertinent part:

[T]he commissioner shall by rule establish a code of standards for the construction, reconstruction, alteration, and repair of buildings, governing matters of structural materials, design and construction, fire protection, health, sanitation, and safety, including design and construction standards regarding heat loss control, illumination, and climate control ... The code must conform insofar as practicable to model building codes generally accepted and in use throughout the United States ... Model codes with necessary modifications and statewide specialty codes may be adopted by reference. The code must be based on the application of scientific principles, approved tests, and professional judgment. To the extent possible, the code must be adopted in terms of desired results instead of the means of achieving those results, avoiding wherever possible the incorporation of specifications of particular methods or materials. To that end the code must encourage the use of new methods and new materials. Except as otherwise provided in sections 16B.59 to 16B.75, the commissioner shall administer and enforce the provisions of those sections

Minnesota Statutes, section 16B.64, subdivision 6, states, “The commissioner shall approve any proposed amendments deemed by the commissioner to be reasonable in conformity with the policy and purpose of the code and justified under the particular circumstances involved....”

The sources of statutory authorities identified above were adopted and effective prior to January 1, 1996, and so Minnesota Statutes, section 14.125, does not apply. *See* Minnesota Laws 1995, chapter 233, article 2, section 58.

Additionally, as part of the codification of the reorganization order, Minnesota Statutes, section 326B.02, subdivision 5, provides a general rulemaking authority to the Commissioner. This general authority states in pertinent part, “The commissioner may, under the rulemaking provisions of chapter 14 and as otherwise provided by this chapter, adopt, amend, suspend, and repeal rules relating to the Commissioner's responsibilities under this chapter”⁵

Lastly, Minnesota Statutes, section 16B.61, subd. 3b,⁶ states that the Commissioner of Labor and Industry “shall adopt rules for radon control as part of the State Building Code for all new residential buildings. These rules shall incorporate the radon control methods found in the International Residential Code appendix as the model language, with necessary amendments to

⁵ 2007 Minn. Laws, Ch. 140, Art. 2, Sec. 3 became effective May 26, 2007.

⁶ 2007 Minn. Laws, Ch. 40, Section 1 became effective on August 1, 2007, and will be codified as Minn. Stat. § 16B.61, subdivision 3b. As of December 1, 2007, Minn. Stat. § 16B.61 will be renumbered in the next bound edition of the statutes as Minn. Stat. § 326B.106 pursuant to 2007 Minn. Laws, chapter 140, article 4, section 61.

coordinate with the other adopted construction codes in Minnesota.”

Pursuant to Minnesota Statutes, section 14.125, the Department published a notice of intent to adopt rules within 18 months of the effective date of the laws authorizing or requiring rules to be adopted. Because the Department’s notice of intent to adopt rules published within 18 months of the effective date of the law, the rulemaking authority has not expired.

Under these statutes, the Department has the necessary statutory authority to adopt the proposed rules.

REGULATORY ANALYSIS

Minnesota Statutes, section 14.131, sets out seven factors for a regulatory analysis that must be included in the SONAR. Paragraphs (1) through (7) below restate these factors and then give the agency’s response.

(1) a description of the classes of persons who probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule:

People who build new homes or remodel existing homes, and people who build new multi-family buildings or remodel existing multi-family buildings, will probably be affected by the proposed rules, as will those individuals who occupy the space or those who own the buildings. Contractors and subcontractors who perform construction work, architects, professional engineers, certified building officials, and window and door manufacturers will probably be affected by the proposed rule.

Ultimately, builders will initially bear the costs of the proposed rules. These costs are then, typically, passed on to owners, who will reap the long-term benefits of the proposed rules.

(2) The probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues:

The probable costs to the agency and to any other agency of the implementation and enforcement of this rule is likely to be consistent with the costs associated with educating interested persons about newly adopted rules. The Division believes, however, that any probable costs are likely to be lower due to the simplification of the rule.

The Division does not anticipate any effect on State revenues.

(3) A determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule:

The Division has determined that there are no less costly methods for achieving the purpose of the proposed rule. Consistent with the mandate to provide basic and uniform

performance standards, establish reasonable safeguards for health, safety, welfare, comfort, and security of Minnesota's residents, and to provide for the use of modern methods, devices, materials, and techniques, in addition to including design and construction standards regarding heat loss control, illumination, and climate control, the Division worked with an advisory committee to develop a proposed rule that results in a minimum cost for all parties. Additionally, the proposed rules establish uniform performance standards, which results in requirements that do not contain hidden costs.

The Department has also determined that amending this rule is the least intrusive method for achieving the purpose of the proposed rule. With this proposed rule and for the convenience of users that must comply or enforce the code, the Department has reorganized existing energy code rules that are currently located in three rule chapters into one rule chapter.

(4) a description of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the agency and the reasons why they were rejected in favor of the proposed rule:

The advisory committee and the Division reviewed and considered alternative methods such as the Department of Energy (DOE) proposed amendments to the ICC Model Codes and to the IECC. The DOE proposals became part of Chapter 11 of the IRC, which are incorporated by reference in these proposed. Chapter 11 was then compared to the IECC model code. However, the IECC model was rejected in favor of the proposed rule because it includes commercial energy provisions and does not reflect Minnesota's current energy code requirements.

(5) the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals:

The probable costs of complying with the proposed rules will be those incurred through the implementation of installing a residential mechanical ventilation system in multi-family residences that fall under the scope of the proposed rules. Although, building owners are likely to bear any additional cost related to a residential mechanical ventilation system, they are the most likely to benefit from such an installation.

(6) the probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals:

The probable costs or consequences of not adopting the proposed rules could be the construction of new buildings that are less durable or less resistant to degradation than those that will be built under the proposed rules.

(7) An assessment of any differences between the proposed rule and existing federal regulations and a specific analysis of the need for and reasonableness of each difference:

The Energy and Policy Act of 1992⁷ requires that a state energy code meet or exceed the ASHRAE Standard 90.1-1989. The Division has determined that the 2004 edition of this standard meets or exceeds the 1989 standard.

Additionally, the appliance and equipment efficiencies contained in the proposed rule are identical to the efficiencies specified by the National Appliance Energy Conservation Act and the Energy Policy Act of 1992.

PERFORMANCE-BASED RULES

Minnesota Statutes, sections 14.002 and 14.131, require that the SONAR describe how the Department, in developing the rules, considered and implemented performance-based standards that emphasize superior achievement in meeting its regulatory objectives and maximum flexibility for the regulated party and the Department in meeting those goals.

Minnesota Statutes, section 16B.6175, requires that the Department use research and analysis addressing, at a minimum, air quality, building durability, moisture, enforcement, enforceability cost benefit, and liability in adopting all or part of a model energy code. These proposed rules reflect the Division's consideration of this research and analysis.

ADDITIONAL NOTICE

Minnesota Statutes, sections 14.131 and 14.23, require that the SONAR contain a description of the Department's efforts to provide additional notice to persons who may be affected by the proposed rules or explain why these efforts were not made.

This Additional Notice Plan was reviewed by the Office of Administrative Hearings and approved in a July 17, 2008 letter by Administrative Law Judge Barbara L. Neilson.

We will mail or email the Dual Notice of Intent to Adopt Rules to interested parties. Those parties include:

1. All certified building officials. This includes all municipal building officials that are responsible for the administration of the State Building Code;
2. Residential Energy Code Advisory Committee Members;
3. American Association of Radon Scientists and Technologists;
4. National Radon Safety Board;
5. National Environmental Health Association;
6. Conference of Radiation Control Program Directors;
7. Minnesota Department of Health's State Indoor Radon Grantees;
8. American Institute of Architects—Minnesota; and
9. Minnesota Society of Professional Engineers.

⁷ 10 C.F.R § 420.15.

We will publish the proposed rules, the Statement of Need and Reasonableness, and the Dual Notice of Intent to Adopt Rules on the Department's website, which is located at http://www.doli.state.mn.us/rulemaking_activity.html.

Our Notice Plan also includes giving notice required by statute. We will mail the Dual Notice of Intent to Adopt Rules to everyone who has registered to be on the Department's rulemaking mailing lists pertaining generally to all rulemakings related to the construction codes and specifically to all rulemakings related to the adoption of the International Building Code, the adoption of the International Residential Code, and the Mechanical Code, which are maintained pursuant to Minnesota Statutes, section 14.14, subdivision 1a.

We will also give notice to the Legislature per Minnesota Statutes, section 14.116.

CONSULT WITH FINANCE ON LOCAL GOVERNMENT IMPACT

As required by Minnesota Statutes, section 14.131, the Department has consulted with the Commissioner of Finance. We did this by sending Keith Bogut, Executive Budget Officer at the Department of Finance copies of the documents sent to the Governor's Office for review and approval by the Governor's Office prior to the Department publishing the Notice of Intent to Adopt. We sent the copies on April 16, 2008. The documents included: the Governor's Office Proposed Rule and SONAR Form; almost final draft rules, dated 11/06/07; and almost final SONAR. Mr. Bogut sent a memorandum dated April 25, 2008, which included the following comments:

Since the new rule only impacts future building projects, no costs will be incurred resulting from any requirement to retrofit existing buildings. Local governments may actually experience lower costs as the proposed rule is simpler and easier to understand and enforce.

In my opinion, the proposed changes will not impose a significant cost on local governments.

COST OF COMPLYING FOR SMALL BUSINESS OR CITY

Agency Determination of Cost

As required by Minnesota Statutes, section 14.127, the Department has considered whether the cost of complying with the proposed rules in the first year after the rules take effect will exceed \$25,000 for any small business or small city. The Department has determined that the cost of complying with the proposed rules in the first year after the rules take effect will not exceed \$25,000 for any small business or small city. The proposed rules are simpler and easier to understand. Therefore, the Division believes that builders of residential structures will find it easier to comply with the code and easier for those administering and enforcing the code to inspect for compliance with the code.

The simplification of these rules will result in a cost savings due to a more efficient administration and enforcement of these rules because the rules are easier to apply and understand, which the Division believes will result in fewer construction delays. Additionally, these rules do not require any building or remodeling to occur.

LIST OF WITNESSES

If these rules go to a public hearing, the Department anticipates having the following witnesses testify in support of the need for and reasonableness of the rules:

1. Department staff from the Construction Codes and Licensing Division;
2. Advisory Committee members;
3. Staff from the Department of Health, Indoor Air Quality Division; and
4. William J. Angell, University of Minnesota.

RULE-BY-RULE ANALYSIS

1322.0010 DEFINITIONS.

This part specifies the definitions that are applicable to this chapter, which the Division believes will be helpful to all users of these rules. This part primarily defines the various acronyms that are used throughout the chapter. Definitions have been included in the proposed rules so that the words that are used throughout the rules are consistently understood by the users of the rule.

1322.0015 ADMINISTRATION AND PURPOSE.

Subpart 1. Administration. This subpart states that this chapter shall be administered in accordance with Minnesota Rules, chapter 1300, which governs the administration of the State Building Code. This provision is important because Chapter 1300 lists the various administrative rule chapters that comprise the State Building Code. With the adoption of these rules, three of those chapters will be repealed and replaced with Chapter 1322. As such, it is very important that users of the code understand that the provisions of Chapter 1300 apply to the administration of the Residential Energy Code even though it will not be immediately listed in Chapter 1300.

Subp. 2. Purpose. This rule part states that the purpose of Chapter 1322 is to establish a minimum code of standards for the construction, reconstruction, alteration, and repair of buildings, governing matters including design and construction standards regarding heat loss control, illumination, climate control, and radon control methods.

1322.0020 INCORPORATIONS BY REFERENCE.

This rule part specifies that this chapter incorporates chapter 11 of the 2006 IRC, with amendments, as well as the following standards and references:

1. ASHRAE, 2005 *Handbook of Fundamentals*, chapter 29;
2. ASTM E779-87 (1992), Standard Test Method for Determining Air Leakage Rate by Fan Pressurization;
3. ASTM E1677-95, Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls;
4. HVI Standard 915-2006, Loudness Testing and Rating Procedures;
5. HVI Standard 916-2005, Airflow Test Procedure;
6. HVI Standard 920-2005, Product Performance Test Procedure;
7. HVI Standard 920-2005, Product Performance Certification Procedure;
8. ACCA Manual J, Load Calculation for Residential Winter and Summer Air Conditioning, 8th Edition, Air Conditioning Contractors of America;
9. REScheck, residential energy code software, published by the United States Department of Energy;
10. NFRC 100-2001, Procedure for Determining Fenestration Product U-Factors, National Fenestration Rating Council;
11. NFRC 400-2001, Procedure for Determining Fenestration Product Air Leakage, National Fenestration Rating Council; and
12. 101/1.s.2/A440-05, Specification for Windows, Doors, and Skylights, American Architectural Manufacturers Association, Canadian Standards Association, Window and Door Manufacturers Association.

1322.1101 IRC SECTION N1101, GENERAL.

Subpart 1. IRC Section 1101.1 Scope. This subpart amends IRC Section N1101.1 to clearly indicate that the scope of chapter 1322 includes structures constructed to the IRC and IBC (as amended) and that Appendix F (as amended) applies to these structures. By specifically identifying the scope, it is clear that this chapter will include buildings that are typically know as multi-family townhomes and condominiums that are built to the IBC. These structures, for all practical purposes, are single-family units that are independent of any other unit and contain no shared common spaces between the units. These units are commonly built in the manner used to construct traditional one- or two-family dwellings. There are seven exceptions to the scope of this chapter.

Garages: The proposed rule adds the words “including garages” to exception number one of this part since garages are not typically considered conditioned spaces. The Division understands that some individuals will insulate and heat this portion of a structure; however, it is not required to be heated as conditioned space to comply with other provisions of the code or the occupancy classification. This language has been added to increase the clarity of the rule and what portions of the structure it does not cover.

Existing Dwellings: The proposed rule adds an exception to address buildings that were built prior to the adoption of these rules, and are built in a variety of ways with no requirement for any type of documentation related to exactly how it was built and what systems were used, or how they operate. The Division believes it is best to allow remodelers to assess each existing basement that is going to be finished, for moisture and other concerns, independently because the

remodeler is in the best position to make a decision as to what system to use to finish this area. Buildings built after the adoption of this chapter, will have much better and documented systems to build to, that will dramatically reduce and/or remove the moisture and other concerns.

Additions: Additions to an existing dwelling are included as new construction in this code, which is reasonable because that is, in fact, what they are.

Alterations or Repairs: Alterations or repairs to an existing dwelling are required to comply with the code wherever feasible. However and it should be noted, the entire building is not required to be brought into compliance with the code at the time the alteration or repair is performed. The feasibility of compliance is determined by the designated building official of the jurisdiction having authority.

Historic Buildings: Buildings that have been specifically designated as having historical significance or eligibility for listing on the National Register of Historic Places are exempt from the scope of these rules. A state or local jurisdiction must make designations of historical significance. This exception is reasonable because it is likely to be more costly for these structures to comply with the code than the amount of energy saved, and the historic nature and value of the building could be destroyed or compromised.

Mixed Occupancies: Each occupancy is exempt from meeting the requirements of the other occupancy. Said another way, each occupancy is required to meet the requirements applicable to it.

Energy Footprint: Buildings whose peak design energy rate usage is less than 3.4 Btu per hour per square foot or 1.0 Watt per hour per square foot of floor area for all purposes are exempt from the requirements of these rules. This is reasonable since complying with the requirements may be more costly than the amount of energy saved.

Subp. 2. IRC Section N1101.2 Compliance. This section has been amended to delete all references to the International Energy Conservation Code because the Department is not proposing to adopt the International Energy Conservation Code. Additionally, a reference to Figure N1101.2 has been deleted because the proposed rule deletes the figure as explained below.

Subp. 3. IRC Section N1101.2.1. This section is deleted in its entirety because it specifically refers to a table identifying warm and humid counties, which has also been deleted. (See subpart 6 below.)

Subp. 4. Figure N1101.2 Climate Zones. This figure is deleted in its entirety because it reflects climate zones for the continental United States.

Subp. 5. Table N1101.2 Climate Zones by States and Counties. The proposed rule deletes this table in its entirety and replaces it with a table that contains a listing of Minnesota's counties by climate zone. The Division believes that proposing a table that contains Minnesota specific information will result in less confusion for users as irrelevant information pertaining to the rest

of the continental United States will not appear in the table.

The IRC climate zone table divides Minnesota's counties into either Zone 6 or Zone 7. The Division has renamed these zones the Northern Zone and the Southern Zone to make the table easier for users to understand and remember.

Subp. 6. Table N1101.2.1. The proposed rule deletes Section N1101.2.1, Warm Humid Counties, because warm and humid climate zones are not located in Minnesota.

Subp. 7. IRC Section N1101.3 Identification. This section is amended by adding subsection N1101.3.1, which addresses plans and specifications, and relocates Minnesota Rules, part 7672.0300, subpart 2, which has been amended.

The proposed rule requires that plans and specifications show pertinent data and features of the building, the equipment, and the systems governed by the rules such as: design criteria, exterior envelope component materials and their locations, *U*-Factors of the envelope systems, *R*-values of insulating materials, size and type of apparatus and equipment, equipment and systems controls in sufficient detail to indicate conformance with the requirements of these rules. The Division believes that it is reasonable to require permit applicants to submit pertinent data, that is sufficiently detailed to demonstrate compliance, so that the code official can complete a plan review and verify compliance with the Energy Code at the time of initial application. The Division believes that this will result in a more streamlined, efficient, and timely plan review process.

Subp. 8. IRC Section N1101.4 Building thermal envelope insulation. This IRC section is deleted in its entirety and replaced with the following:

All thermal insulation must conform to Minnesota Rules, chapter 7640, Minnesota Thermal Insulation Standards, adopted by the Department of Commerce. Insulation shall be manufactured for its intended use, installed according to the manufacturers specifications, and be no less than the stated performance at winter design conditions. Insulation used on the exterior for the purpose of insulating foundation walls shall be a water-resistant material and comply with ASTM C578, C612, or other approved standards. An R-value identification mark shall be applied by the manufacturer to each piece of building thermal envelope insulation 12 inches (305 mm) or more wide. Alternatively, the insulation installers shall provide a certification listing the type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope as described in section N1101.8. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled R-value, installed density, coverage area and number of bags installed shall be listed on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the area covered and R-value of installed thickness shall be listed on the certificate. When using blown or sprayed insulation (fiberglass, cellulose or sprayed polyurethane foam) requirements from Sections N1101.4.1, N1101.4.1.1, and N1101.4.1.2 shall be met accordingly.

This proposed rule adds language to the model code in order to provide more detail about what requirements must be met while retaining the intent of the model code. The modifications properly refer to other sections of the code, which the Division believes will result in a more complete and timely plan review for these structures.

Minnesota Rules, Chapter 7640, Minnesota Thermal Insulation Standards,⁸ specifies that a product is an insulation product by design and testing. The proposed rule intends to address the reality that one manufacturer's product may not perform in a similar or comparable manner to another. It is important to require that these products be used as they are intended to be used and that they be installed according to the manufacturer's specifications. The Division believes that this is important because the manufacturer's specifications represent the requirements that the product was tested to and certified under. The final change to this section addresses the need for addressing blown or sprayed in insulation systems and where in the Code users will find their requirements.

N1101.4.1 Blown or sprayed roof/ceiling insulation. The proposed rule references specific subsections that apply to blown or sprayed roof/ceiling insulation. The subsections clarify each requirement, which will eliminate potential confusion.

N1101.4.1.1 Attic thickness markers. This added subsection serves two main purposes: so that the code official is able to verify that the required amount of insulation was installed; and to provide the installer with a convenient visual guide to install the required amount of insulation. There is a reasonable need to require attic thickness markers. These markers are very important to the code official and to the installer. This language is currently included in Minnesota's Energy Code, which has been very useful in getting the proper insulation levels needed for code compliance. Currently, markers are required every 300 square feet. The proposed rule requires markers every 100 square feet in order to provide the code official and the installer with a method to ensure that the required amount of insulation is installed in an even and consistent manner. The proposed rule requires that the markers face the attic opening so that the code official can easily read the marker during the inspection process.

N1101.4.1.2 Attic insulation card. This rule requires that a signed and dated insulation card be attached to the framing near the access opening so that those in need of the information in the future (homeowner, inspector, future contractors) will have all the pertinent information related to the original attic insulation. The rule also requires this information to be included on the building certificate required by section N1101.8. Requiring this information in two places (the attic insulation card and the building certificate), ensures that the information will be available in the event that the card or certificate is destroyed or misplaced. It is reasonable to identify, at the time of installation, what insulation is installed in the attic and what code requirements have been satisfied by that particular installation so that the code official can inspect compliance prior to the sealing of the attic access panel.

⁸ This rule chapter is administered by the Minnesota Department of Commerce.

N1101.4.2 Insulation mark installation. This section requires that the manufacturer's *R*-value mark be readily visible after installation and upon inspection. The language of Chapter 11 has not been modified.

Subp. 9-12. IRC Section N1101.5 Fenestration Product Rating; Table N1101.5(1), Table N1101.5(2), and Table N1101.5(3). 2006 IRC Section N1101.5 has been amended to include language to address the *U*-factors of fenestration products using a nationally recognized testing and labeling procedure, and air leakage of fenestration products using a nationally recognized testing procedure listed in another section of this code. Reference(s) to Solar Heat Gain Coefficient (SHGC) have been deleted since Minnesota's climatic conditions actually encourage solar heat gain on buildings during most of the year and the SHGC is intended to discourage solar heat gain.

Table N1101.5(1). This table, which identifies default glazed fenestration *U*-factors, has been amended by modifying the *U*-Factors for single and double pane skylights with metal frames. The amended *U*-factors are as follows:

| | |
|-----------------------|------|
| Skylight: Single pane | 1.60 |
| Skylight: Double pane | 1.05 |

Table N1101.5(2). Although this language is underscored in the proposed rules, the Division is not proposing any changes to this table.

Table N1101.5(3) Default Glazed Fenestration SHGC. This table specifies the default glazed fenestration solar heat gain coefficient (SHGC). As discussed above, Minnesota encourages solar heat gain. As a result, this table is deleted in its entirety because it is not applicable to Minnesota's climatic conditions.

Subp. 13. IRC Section N1101.6 Installation. This IRC section requires that materials, systems, and equipment shall be installed according to the manufacturer's installation instructions and the provisions of this Code. The proposed rule amends this section by adding the words "conditions of any listing or required certifications," so that these types of installations incorporate any additional requirements that are based upon any national testing (the listing) or national certification that the material, system, or equipment bears. The Division believes that requiring these installations to be in accord with installation instructions, any listing or certification requirements, and complying with the Energy Code is reasonable.

The proposed rule deletes IRC Section N1101.6.1, protection of exposed foundation insulation, in its entirety because the requirements are addressed by proposed rule in Section N1102.2.6.

Subp. 14. IRC Section N1101.7 Above code programs. The proposed rule deletes this section, which permits regulating jurisdictions to exceed the requirements of chapter 11 of the IRC, in its entirety because the Minnesota State Building Code does not permit regulating jurisdictions to

adopt a code that is any less or any more restrictive than the code.⁹

Subp. 15. IRC Section N1101.8 Certificate and Table N1101.8. The proposed rules delete this IRC section, which requires the posting of a permanent certificate on or in the electrical distribution panel, and replaces it with the following:

N1101.8 Building Certificate. A building certificate shall be posted in a permanently visible location inside the building. The certificate shall be completed by the builder and shall list information and values of components listed in Table N1101.8.

Table N1101.8

| Component | Certificate requirements |
|---|---|
| Date certificate is installed | Posted date |
| Dwelling or dwelling unit location | Mailing address and city |
| Residential Contractor | Name and license number of residential contractor |
| Insulation installed in or on ceiling/roof, walls, slab-on-grade, and floor | Type and installed R-value |
| Rim joist and foundation wall insulation | Installed R-value, type, and whether the insulation is exterior, integral, or interior |
| Fenestration | Average U-factor and SHGC |
| Ducts outside conditioned spaces | Installed R-value |
| Mechanical ventilation system | Type, location, and design continuous and total ventilation rates |
| Make-up air and combustion air systems (if installed) | Type, location, and size |
| Heating system | Type, input rating, AFUE or HSPF, manufacturer, model, and the structures' calculated heat loss |
| Domestic water heater | Type, size, manufacturer, and model |
| Cooling system (if installed) | Type, output rating, SEER, manufacturer, model, calculated cooling load, and the structure's calculated heat gain |
| Radon control system | Passive or active |

The Division believes that the posting of a permanent certificate at the electrical distribution panel may be confusing in that Minnesota law already requires specific postings at

⁹ Minn. Stat. § 16B.62.

this location. Having said that, it is important that specific information related to the energy code is permanently posted within residential structures. The proposed language clearly specifies the information that must be present on the certificate and that the certificate must be posted inside the structure.

Proposed Table N1101.8 specifies that the certificate is required and the information the certificate is required to contain. Requiring the certificate is intended to identify how the structure was originally built and which products were used in order to show compliance with this Code, to inform current and subsequent owners, and to provide information that may be pertinent to changes that may be made to the structure in the future.

The table also requires the certificate to show the calculated heating loads and the calculated cooling loads by calculating the heat loss and cooling loss. These loads are then used to size the mechanical equipment for the structure. This information can then be used to retain or improve the performance and efficiency of the building.

1322.1102 IRC SECTION N1102, BUILDING THERMAL ENVELOPE.

The proposed rule amends this section and its subsections, and adds two new subsections: N1102.1.4, REScheck Alternative, and N1102.1.5, Thermal Envelope System Alternative (Engineered System Alternative).

Subpart 1. IRC Section N1102.1 Insulation and fenestration criteria. This section has been amended to add a reference to proposed Table N1102.1.2 so that a building envelope can meet the requirements of either Table N1102.1, which is based mostly on *R*-values of the building components, or Table N1102.1.2, which is based on *U*-values of the buildings components.

Subp. 2. N1102.1.1 *R*-value computation. Following the advisory committee's recommendation, this subsection has been amended to address the thermal performance of those foundation systems that do not have continuous insulation and those that have concrete block with integral insulation because chapter 11 of the IRC does not address either of these situations. Because these foundations are typical to Minnesota items 1 and 2 provide national performance measures that must be used to accomplish this computation.

Subp. 3. N1102.1.2 *U*-factor alternative. This proposed rule deletes the exceptions from this subsection because the climate zones do not exist in Minnesota's climate zones.

Subp. 4. N1102.1.3 Total UA alternative. The proposed rules amend this subsection by removing the parenthetical "multiplied by the same assembly area as in the proposed building" because it has caused confusion when these calculations are already considered in the ASHRAE 2005 *Handbook of Fundamentals* that is referred to by the language. The proposed rule also deletes the last sentence, "The SHGC requirements shall be met in addition to UA compliance," because the solar heat gain coefficient is not applicable to Minnesota's climatic conditions.

Subp. 5 and 6. Tables N1102.1 Insulation and fenestration requirements by component,

and N1102.1.2 Equivalent *U*-factors. There were several changes to these tables in order to make them Minnesota specific. The proposed rules reflect the advisory committee's recommendation that any climate zone that is not present within Minnesota's boundaries be deleted, and includes additional amendments to bring the table values more consistently in line with current energy code requirements.¹⁰

Subp. 7. N1102.1.4 REScheck Alternative. This subsection moves Minn. Rules, part 7672.0800, subpart 7, which permits the use of the REScheck computer program, which is published by the United States Department of Energy. The advisory committee felt it was reasonable to continue to allow the use of the REScheck computer software program because this program has been used successfully to show compliance with the code.

The committee also felt it reasonable to make changes to REScheck so that trade offs that result in an *R*-value below the required *R*-values or higher than the required *U*-values would not be permitted. The proposed rule is consistent with the prescriptive requirements of the code while providing an alternate method for compliance. This provision will permit builders, designers, and owners to use a computer software program to model trade offs that are specific to Minnesota without permitting trade offs that will lessen the minimum requirements nor increase the maximum requirements prescribed by this code. This trade off version will show compliance of the envelope of buildings such as log homes, site-specific engineered systems, renewable energy systems and other non-traditional designs.

Subp. 8. N1102.1.5 Thermal Envelope System Alternative (Engineered System Alternative). The advisory committee recommended that the proposed rule include language that permits a code official to accept design drawings containing energy calculations that are certified by a Minnesota licensed architect, and design drawings containing energy calculations or energy system design that are certified by a Minnesota licensed professional engineer.¹¹ The Division believes that these certifications provide an adequate assurance that the energy calculations have actually been calculated and/or the energy system has been designed to comply with the Residential Energy Code.

Subp. 9. IRC Section N1102.2 Specific Insulation Requirements. The amendments to this section are limited to its subsections.

N1102.2.1 Ceilings with attic spaces. The proposed rule deletes this section in its entirety because the climate zones do not apply to Minnesota and the pertinent language has been moved to Table N1102.1 as footnote (a),¹² and the rest of the section has been dealt with in a footnote for ceiling *R*-values in table N1102.1. Because the pertinent language has been relocated into the footnote, this subsection is no longer necessary.

¹⁰ These requirements are currently contained in Minn. R. part 7670.0470 and 7672.0600.

¹¹ The Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience, and Interior Design is the licensing authority for *inter alia* architects and professional engineers. For more information visit: www.aelslagid.state.mn.us.

¹² For a discussion of Table N1102.1, see page 15.

N1102.2.2 Ceilings without attic spaces. The proposed rule does not amend this subsection of the model code.

N1102.2.3 Mass walls. The proposed rule amends this subsection by deleting language that pertains to mass walls that are not built in, or typical to, our climate. Additionally, language specific to mass walls that are built in our climate is addressed in Section N1102.1.

N1102.2.4 Steel-frame ceilings, walls and floors. The proposed rules do not amend this subsection of the model code.

Table N1102.2.4 Steel-framed ceiling, wall and floor insulation (*R*-value). The proposed rules amend this table by changing various *R*-values so that they correspond with the wood frame *R*-value requirements found in Table N1102.1. Footnote (a) was amended for clarification by replacing the words “followed by continuous insulation *R*-value” with “followed by a “+” and the continuous *R*-value, if applicable.”

N1102.2.5 Floors. The proposed rules do not amend this subsection of the model code.

N1102.2.6 Basement Walls. Minnesota’s climate requires and demands that we be much more specific on how basement walls are constructed. These walls are enclosing conditioned spaces, have been researched, and much better code language with more details are being written into this code for Minnesota, as previously addressed in this SONAR.

Since the early 90’s, Minnesota is one of a handful of states that requires finished or unfinished basements to be insulated. Basements are rare in the housing stock of most other states and it is fair to say that Minnesota has more experience insulating foundations than anywhere else in the country.

There is currently confusion among the code officials that administer and enforce this code. The confusion hinges on the ambiguity and technical wordings of current energy code requirements for foundations. In some circumstances, contractors that complied with the building code—including the energy code, were receiving callbacks from homeowners because of wet basements. Minnesota has one of the most complex climates for buildings since foundation walls face extreme temperature swings and different vapor pressures throughout the year.

The proposed rule deletes this subsection and replaces it with the following language:

N1102.2.6 Foundation Wall Insulation Prescriptive Option.

N1102.2.6.1 Foundation insulation. Foundation insulation of basement and crawl space walls and the perimeter of slab-on grade floors must comply with this section. Insulation materials shall be installed according to manufacturer’s installation specifications and any additional requirements of Section N1102.2.6.1 to N1102.2.6.11. Adding additional insulation to increase *R*-values or adding an additional vapor retarder to foundation wall assemblies, other than those required in

this section, is prohibited.

Exceptions:

1. Foundation walls enclosing unconditioned spaces shall meet this requirement unless the floor overhead is insulated in accordance with Section N1102.1.
2. Permanent wood foundations shall meet the requirements of Section R401.1.
3. Frost protected shallow foundations shall meet the requirements of Section R403.3.
4. Insulating concrete form materials shall meet the requirements of Section R611.

N1102.2.6.2 Basement foundation and crawl space walls. Basement foundation and crawl space walls shall be insulated from the top of the foundation wall down to the top of the footing or from the top edge of the interior wall to the top of the slab if insulation is on the interior.

N1102.2.6.3 Slab-on-grade and basement walkout foundation walls. Slab-on-grade and basement walkout foundation wall insulation shall extend to the design frost line or top of footing, whichever is less. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the code official as having termite infestation.

N1102.2.6.4 Foundation wall and rim joist area thermal insulation requirements. The foundation wall system and rim joist area shall have an insulating layer with minimum thermal properties as required in this section. The insulation layer must be a minimum R-10 in accordance with Table N1102.1.

Exception: In the Southern Zone, the foundation and rim joist area insulation may be reduced to a minimum of an R-5 if:

1. The insulation is located on the exterior or is integral to the foundation wall; and
2. An additional R-5 insulation is added to the minimum attic R-value level; and
3. The heating system meets the minimum efficiency ratings in Table N1102.2.6.4; and
4. A minimum of a six-inch energy heel is used for the roof framing and/or truss system.

[This space intentionally left blank.]

Table N1102.2.6.4 HVAC System Minimum Efficiency Requirement to Qualify for R-5 Exterior Insulation in the Southern Zone

| Heating System Type | Minimum Efficiency Rating | |
|---|---------------------------|------|
| | AFUE | HSPF |
| Furnace, Gas or Oil Fired | 90% | N/A |
| Boiler, Gas or Oil Fired | 85% | N/A |
| Heat Pump, Split Systems | N/A | 8.0 |
| Heat Pump, Single Package or Equipment (including gas/electric package units) | N/A | 7.7 |

N1102.2.6.5 Integral foundation insulation requirements. An insulation assembly installed integral to the foundation walls shall be manufactured for its intended use and installed according to the manufacturer's specifications.

N1102.2.6.6 Exterior foundation insulation requirements. An insulation assembly installed on the exterior of the foundation walls and the perimeter of slabs-on-grade:

1. Shall be of water resistant materials manufactured for its intended use;
2. Shall be installed according to the manufacturer's specifications;
3. Shall comply with either ASTM C578, C612 or C1029 as applicable; and
4. Shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend a minimum of 6 inches (152 mm) below grade. The insulation and protective covering system shall be flashed in accordance with the IRC Section R703.8.

N1102.2.6.7 Interior foundation insulation requirements. An insulation assembly installed on the interior of foundation walls shall meet the following provisions:

1. Masonry foundation walls shall be drained through the masonry block cores to an approved interior drainage system.
2. If a frame wall is installed, it shall not be in direct contact with the foundation wall unless that interior side of the foundation wall has been waterproofed.
3. Comply with the interior air barrier requirements in Section N1102.4.1.
4. Comply with Section N1102.2.6.8, N1104.2.2.6.9, N1102.2.6.10, or N1102.2.6.11.

N1102.2.6.8 Rigid interior insulation. Rigid interior insulation shall comply with the following as applicable:

1. Either ASTM C578 or ASTM C1289.
2. Dampproofing, waterproofing, or a water repellent shall be applied to the exposed above grade foundation walls or a layer of dampproofing or

waterproofing shall be installed on the entire inside surface of the foundation wall. Water-repellant materials shall comply with ASTM E514 with 90 percent or greater reduction in water permeance when compared to an untreated sample.

3. Installation requirements:
 - a) must be in contact with the foundation wall surface;
 - b) vertical edges shall be sealed with acoustic sealant;
 - c) all interior joints, edges, and penetrations shall be sealed against air and water vapor penetration;
 - d) horizontally continuous acoustic sealant exists between the foundation wall and the insulation at the top of the foundation wall; and
 - e) horizontally continuous acoustic sealant between the basement floor and the bottom insulation edge.
4. The insulation shall not be penetrated by the placement of utilities or by fasteners or connectors used to install a frame wall.

N1102.2.6.9 Spray applied interior insulation. Spray-applied interior insulation shall comply with the following as applicable:

1. Closed cell polyurethane:
 - a. ASTM C1029 compliant with a permeance not greater than 1 in accordance with ASTM E96 procedure A.
 - b. Sprayed directly onto the foundation wall surface. There must be a 1 inch minimum gap between the foundation wall surface and any framing.
 - c. The insulation shall not be penetrated by the placement of utilities.
 - d. Through penetrations shall be sealed.
2. One-half pound free rise open cell foam:
 - a. Sprayed directly onto the foundation wall surface. There must be a 1 inch minimum gap between the foundation wall surface and any framing.
 - b. The insulation shall not be penetrated by the placement of utilities.
 - c. Through penetrations shall be sealed.

N1102.2.6.10 Semi-rigid interior insulation. Semi-rigid interior insulation shall comply with the following:

1. ASTM C1621 with a maximum permeance of 1.1 per inch.
2. Must have a minimum density of 1.3 pcf and have a fungal resistance per ASTM C1338.
3. Installation requirements:
 - a. Must be in contact with the foundation wall surface;
 - b. Vertical edges shall be sealed with acoustic sealant;

- c. All interior joints, edges, and penetrations shall be sealed against air and water vapor penetration;
- d. Horizontally continuous acoustic sealant shall be applied between the foundation wall and the insulation at the top of the foundation wall; and
- e. Horizontally continuous acoustic sealant shall be applied between the basement floor and the bottom insulation edge.

N1102.2.6.11 Unfaced fiberglass batt interior insulation. Unfaced fiberglass batt interior insulation shall comply with the following:

- 1. Waterproofing shall be applied to the entire inside surface of the foundation wall.
- 2. The top and bottom plates must be air sealed to the foundation wall surface and the basement floor.
- 3. In addition, an air barrier material and vapor retarder material with a minimum permeance of at least 1, in accordance with ASTM E96 procedure A, and shall be installed on the warm-in-winter side of the foundation insulation meeting the following:
 - a. Air sealed to the framing with construction adhesive or equivalent at the top and bottom plates and where the adjacent wall is insulated;
 - b. Air sealed utility boxes and other penetrations; and
 - c. All seams shall be overlapped at least six inches and sealed with compatible sealing tape or equivalent; and
- 4. Up to R-13 batts are allowed.

N1102.2.6.12 Foundation wall insulation performance option. Insulated foundation systems designed and installed under the performance option shall meet the requirements of this section.

N1102.2.6.12.1 Water separation plane. The foundation shall be designed and built to have a continuous water separation plane between the interior and exterior. The interior side of the water separation plane must:

- 1. Have a stable annual wetting/drying cycle whereby foundation wall system water (solid, liquid, and vapor) transport processes produce no net accumulation of ice or water over a full calendar year and the foundation wall system is free of adsorbed water for at least four months over a full calendar year;
- 2. Prevent conditions of moisture and temperature to prevail for a time period favorable to mold growth for the materials used; and
- 3. Prevent liquid water from the foundation wall system reaching the foundation floor system at any time during a full calendar year.

N1102.2.6.12.2 Documentation. The foundation insulation system designer shall provide documentation certified by a professional engineer registered in

Minnesota demonstrating how the requirements of this section are fulfilled. The foundation insulation system designer shall also specify the design conditions for the wall and the design conditions for the interior space for which the water separation plane will meet the requirements of this section. The foundation insulation system designer shall provide a label disclosing these design conditions. The label shall be posted in accordance with Section N1101.8.

N1102.2.6.12.3 Installation. The water separation plane shall be designed and installed to prevent external liquid or capillary water flow across it after the foundation is backfilled.

N1102.2.6.12.4 Foundation air barrier. The foundation insulation system shall be designed and installed to have a foundation air barrier system between the interior and the exterior. The foundation air barrier system must be a material or combination of materials that is continuous with all joints sealed and is durable for the intended application. Material used for the foundation air barrier system must have an air permeability not to exceed $0.004 \text{ ft}^3/\text{min}\cdot\text{ft}^2$ under a pressure differential of 0.3 inches water (1.57 psf) ($0.02 \text{ L}/\text{s}\cdot\text{m}^2$ at 75Pa) as determined by either commonly accepted engineering tables or by being labeled by the manufacturer as having these values when tested in accordance with ASTM E2178.

N1102.2.7 Slab-on-grade floors. The proposed rules delete this subsection in its entirety because Minnesota specific requirements appear in N1102.2.6.2 and N1102.2.6.3 above.

N1102.2.8 Crawl space walls. The proposed rules delete this subsection in its entirety because Minnesota specific requirements appear in N1102.2.6.2 and N1102.2.6.3 above.

N1102.2.9 Masonry veneer. The proposed rules do not amend this subsection of the model code.

N1102.2.10 Thermally isolated sunroom insulation. The proposed rules delete this subsection and replace it with language that is specific to Minnesota. The subsection now addresses Minnesota's climate zones and sunroom construction requirements. The Division believes that the proposed rule is easier to understand, comply with, and administer.

Subp. 10. IRC Section N1102.3 Fenestration. The amendments to this model code section are limited to its subsections, some of which have been renumbered because of the deletion of subsection N1102.3.2 in its entirety.

N1102.3.1 U-factor. The proposed rules do not amend this subsection of the model code.

N1102.3.2 Glazed fenestration SHGC. The proposed rules delete this subsection in its entirety because Minnesota is identified as a cool climate and solar heat gain is encouraged.

N1102.3.3 Glazed fenestration exemption. This subsection has been amended by deleting a

reference to the Solar Heat Gain Coefficient (SHGC) because solar heat gain is encouraged by Minnesota's climatic conditions. (Renumbered N1102.3.2)

N1102.3.4 Opaque door exemption. The proposed rules do not amend this subsection of the model code. (Renumbered N1102.3.3)

N1102.3.5 Thermally isolated sunroom *U*-factor. The proposed rules amend this subsection by deleting language pertaining to climate zones that do not exist in Minnesota. Because the *U*-values pertaining to Minnesota's climate zones are addressed in Tables N1102.1 and N1102.1.2, the following sentence is deleted: For zones 4 through 8 the maximum fenestration *U*-factor shall be 0.50 and the maximum skylight *U*-factor shall be 0.75. (Renumbered N1102.3.4)

N1102.3.6 Replacement fenestration. The proposed rule amends this subsection by deleting all references to the Solar Heat Gain Coefficient (SHGC). The proposed rule adds the words "some or all" and "excluding those items considered as repair or maintenance" to make the language consistent with Minnesota Rules, Chapter 1309, which, in part, addresses replacement fenestration products. This section is also amended to add the words "unless exempt under section N1102.3.3" to identify the exception. (Renumbered N1102.3.5)

Subp. 11. N1102.4 Thermal envelope air leakage. The proposed rule amends the headnote of this section, in addition to deleting and replacing subsection N1102.4.1 and adding subsection N1102.4.4. The proposed rule does not amend subsections N1102.4.2 or N1102.4.3.

The headnote is amended by changing it from "air leakage" to "thermal envelope air leakage," which is a more specific finding tool for users of the code as it reflects the terminology used by Minnesota builders and remodelers.

N1102.4.1 Building thermal envelope. This subsection has been deleted in its entirety and replaced with subsection N1102.4.1, Interior air barrier, because it reflects the terminology used by Minnesota builders and remodelers.

The proposed rule clarifies the interior air barrier requirements and locations. The Division believes that limiting this subsection to interior air barriers will make the rule clear to users of the code.

N1102.4.2 Fenestration air leakage. The proposed rules do not amend this subsection of the model code.

N1102.4.3 Recessed lighting. The proposed rules do not amend this subsection of the model code.

N1102.4.4 Exterior wind wash barrier. The model code does not address exterior wind wash for residential structures. The proposed rule moves current exterior wind wash requirements, with amendments, from Minn. R. part 7670.0470, subpart 6, item D, and Minn. R. part 7672.0600, subp. 3, which are identified for repeal to accommodate the transition from three rule

chapters to a single rule chapter. The proposed rule requires the installation of an exterior wind wash barrier at specific locations when they separate conditioned space from non-conditioned space so that the insulation is more likely to remain in place and perform as intended. This amendment is consistent with current energy code requirements.

Subp. 12. N1102.5 Vapor diffusion management. The proposed rule deletes IRC Section N1102.5, Moisture Control, in its entirety and replaces it with language pertaining to vapor diffusion management in those areas where specific requirements for vapor management are essential.

N1102.5.1 Exterior wall vapor retarder. The addition of this language specifically addresses the rim joist areas of a building. Currently, some builders construct exterior wall vapor retarders in the same manner as the foundation wall or an above grade frame wall. The proposed rule is intended to clarify the location of the building envelope so that the provisions of the code can be satisfied. The proposed rule also specifies that the vapor retarder needs to be sealed only when it used as the air barrier.

N1102.5.2 Under-slab vapor retarders. This subsection was added to specifically state that under-slab vapor retarders are required to meet the provisions of the IRC and Appendix F.

N1102.5.3 Crawl space floor vapor retarder. This subsection was added to specifically state that the floors of insulated crawl spaces are required to be covered with a vapor retarder meeting the provisions of the IRC and Appendix F.

Subp. 13. IRC Section N1102.6 Alterations and repairs to existing residential buildings. The proposed rule amends the IRC by adding this section, which addresses alteration and repairs to existing residential buildings. This section along with its subsections will give the user of the code a specific location to find the code requirements for these buildings.

The proposed rule is as follows:

N1102.6.1 Reducing air leakage. If an addition or alteration reduces the air leakage characteristics or capacity of a building then a combustion and makeup air supply must be provided according to the State Building Code, Minnesota Rules, chapter 1346. Alterations that will likely reduce the air leakage characteristics or capacity of a building include, but are not limited to, attic insulation, wall insulation, applying siding underlayment, or the replacement of a majority of window or door units.

N1102.6.2 Conversions. A change in the occupancy of an existing building meeting the scoping provisions of this chapter that would require an increase in demand for either fossil fuel or electrical energy supply shall comply with the requirements of this chapter.

Exception: Existing HVAC and service water heating equipment within an existing building is not required to be replaced.

N1102.6.3 Penetrations. Penetrations resulting as part of an alteration must be sealed. This includes, but is not limited to, penetrations for telecommunication wires and equipment, electrical wires and equipment, electronic wires and equipment, fire sprinklers, plumbing and ducts, and penetrations in exterior walls and ceilings.

N1102.6.4 Roofs and ceilings.

- A. Attic insulation may not be installed unless accessible attic bypasses have been sealed.
- B. A ceiling vapor retarder may be omitted if the interior ceiling finish is not removed.

N1102.6.5 Walls.

- A. Storm windows may be installed over existing glazing without meeting the additional requirements of this chapter.
- B. Reglazing and repairs to existing windows are not required to meet the additional requirements of this chapter.
- C. Interior wall finish may not be replaced unless wall cavities have been insulated to full depth. This item shall apply whenever plaster is removed, even though lath may not have been removed.

Exceptions:

- 1. Walls that are back-plastered; and
- 2. Walls without framing cavities.
- D. A vapor retarder is not required if the interior wall finish is not removed.

Section N1102.6.1, Reducing Air Leakage, moves the requirements of Minnesota Rules, parts 7670.0470, subpart 6, item c, and 7672.0600, subp. 4, into this proposed rule chapter.

Section N1102.6.2, Conversions, moves the requirements of Minn. R. parts 7670.0100, subp. 5, item D, and 7672.1200, subp. 4, into this proposed rule chapter.

Section N1102.6.3, Penetrations, moves the requirements of Minn. R. parts 7670.0470, subp. 6, items C-1 and C-3, and 7672.0600, subp. 5 into this proposed rule chapter.

Section N1102.6.4, Roofs and Ceilings, moves the requirements of Minn. R. parts 7670.0470, subp. 6, item D, and 7672.0600, subp. 11, into this proposed rule chapter.

Section N1102.6.5, Walls, moves the requirements of Minn. R. parts 7670.0470, subp. 6, and 7672.0600 into this proposed rule chapter.

1322.1103 IRC SECTION N1103, SYSTEMS.

The proposed rules delete this section of the model code in its entirety and replaces it with code language that is specific to Minnesota and its climatic conditions, and mirrors the requirements of the Minnesota Mechanical Code¹³ as it pertains to ducts and duct systems. In this way, users will be able to easily find the applicable requirements without having to turn to the Mechanical Code.

N1103.1 Controls. The language proposed provides that at least one thermostat shall be provided for each separate heating and cooling system.

N1103.2 Ducts. This provision provides that ducts shall be insulated in accordance with the Mechanical Code, Minn. R. ch. 1346.

N1103.2.1 Insulation. This portion of the proposed rule part requires that ducts be insulated in accordance with the Minnesota Mechanical Code, Minn. R. ch. 1346. Additionally, the proposed language provides minimum required insulation.

N1103.2.2 Sealing. This portion of the proposed rule part refers users to the Minnesota Mechanical Code, Minn. R. ch. 1346. Additionally, the proposed language provides the location, design static pressure, and the minimum required sealing of ducts.

N1103.2.3 Supply ducts. This portion of the proposed rule part requires supply ducts to be continuously ducted in accordance with the Mechanical Code from the point of origin to the point of discharge in habitable spaces. The proposed rule does not permit building framed cavities and building components to be used as supply ducts.

N1103.2.4, Domestic water piping insulation, and Table N1103.2.4, Insulation thickness for nominal pipe diameters. This portion of the proposed rule part requires pipe insulation to have a k-value of 0.27. In those circumstances where a k-value is less than 0.27 then the proposed rule requires the pipe thickness be adjusted to have an equivalent *R*-value.

The proposed rule also provides specific direction pertaining to cold and hot water piping: Cold water piping does not require insulation unless it is located within six inches of any heating pipes. Hot water piping does not require insulation except that all recirculating systems are required to have a minimum of 0.5 inches insulation on the entire loop with an appropriate vapor jacket, and underground hot water piping is required to have a minimum of one inch insulation with an appropriate vapor jacket. This portion of the proposed rule also specifies insulation thicknesses that shall be installed on cold and hot water pipes based the nominal diameter of the pipe.

N1103.2.5 HVAC piping. This portion of the proposed rule part requires that hydronic, steam, and condensate piping to be insulated in accordance with the Mechanical Code, Minn. R. ch.

¹³ Minn. R. ch. 1346; hereinafter Mechanical Code.

1346. The proposal excepts piping that is installed within HVAC equipment and piping installed in basements, crawl spaces, and cellars.

N1103.2.6 Equipment sizing. This portion of the proposed rule requires heating and cooling equipment to be sized in accordance with the Mechanical Code, Minn. R. ch. 1346, and *ACCA Manual J*. This language does not impose any new requirements and is intended to assist users by pointing them to the law regulating the sizing of heating and cooling equipment.

N1103.4 Domestic Circulating hot water systems. This portion of the proposed rule requires circulating hot water systems to have an automatic turn-off switch that turns the circulating pump off when the system is not in use or when the circulating loop temperature is satisfied.

1322.1104 IRC SECTION N1104, MECHANICAL VENTILATION SYSTEMS.

This proposed rule part adds a section to chapter 11 of the IRC so that mechanical ventilation system design and installation are adequately addressed by the Energy Code.

N1104.1 Mechanical ventilation requirements. This portion of the proposed rule covers the continuous and total mechanical ventilation requirements for whole house ventilation at summer and winter climatic design conditions, requires mechanical ventilation systems to meet the requirements of this section, and provides that all unfinished basements, crawlspaces, and levels to be provided with a minimum ventilation rate of 0.02 cfm per square foot, or a minimum of one supply duct and one return duct which shall be separated by one-half the diagonal dimension of the basement to avoid a short circuit of the air circulation. The proposal includes exceptions for kitchen and bath fans that are not included as part of the mechanical ventilation system, and reminds users that these fans are regulated by the Residential Building Code, Minn. R. ch. 1309.

N1104.1.1 Additions or alterations to existing buildings. This portion of the proposed rule requires a whole house mechanical ventilation system, meeting the requirements of this section when an existing building is added to or altered unless the building permit of original construction was applied for prior to April 15, 2000, and did not require a whole house mechanical ventilation system.

N1104.2, Total ventilation rate, and Table N1104.2, Total and continuous ventilation rates (in cfm). This portion of the proposed rule provides that the mechanical ventilation system shall provide sufficient outdoor air to equal the total ventilation rate average, for each one-hour period as indicated in Table N1104.2 or Equation 11-1, based on the number of bedrooms and the square footage or conditioned space, including the basement but excluding conditioned crawlspace. The proposal further provides that the average hourly ventilation capacity for heat recovery ventilators and energy recovery ventilators must be determined with consideration given to any reduction of exhaust or outdoor air intake, or both, for defrost or other equipment cycling per HVI Standard 920.

N1104.2.1 Continuous ventilation. This proposed rule specifies that a minimum of 50 percent of the total ventilation rate, but not less than 40 cfm, shall be provided, on a continuous rate

average for each one-hour period according to Table N1104.2 or Equation 11-2. Automatic cycling controls are permitted on the portion of the mechanical ventilation system that is intended to be continuous providing that the average flow rate for each hour meets the requirements of this section.

N1104.2.1.1 Ventilation rate. This portion of the proposed rule requires continuous ventilation systems be balanced in accordance with section N1104.4.2.

N1104.2.2 Intermittent ventilation. This language provides that the difference between the total ventilation rate and the continuous ventilation rate shall be based on flow rates as designed or as installed.

N1104.3 Ventilation system requirements. This language provides that mechanical ventilation systems can be one of three types: exhaust, balanced, or other method.

N1104.3.1 Exhaust Systems. This language specifies the types of fans that may be used to comply with the continuous ventilation requirement.

N1104.3.2 Balanced, and HRV/ERV systems. This language specifies the requirements for heat recovery ventilators and energy recovery ventilators.

N1104.3.3 Other Methods. This language permits mechanical ventilation systems that consist of exhaust fans, supply fans, or a combination thereof if they comply with Section N1104. The proposed rule further provides that those systems identified in Section N1104.3.1 or N1104.3.2 shall not conflict with each other, and that, for the purposes of Section N1104.3.3, the delivered ventilation rate is the larger of the total air flow of the operating supply fans, or total air flow of the operating exhaust fans.

N1104.4 Installation requirements. This language provides that all types of mechanical systems shall meet the requirements of section N1104, and that installations shall comply with the Mechanical Code, chapter 1346, and the equipment manufacturer's installation instructions.

N1104.4.1 Air distribution and calculation. This section requires that outdoor air be delivered to each habitable space by a forced air circulation system, a separate duct system, individual inlets, or a passive opening.

N1104.4.1.1 Forced air circulation systems, and Table N1104.1.1(1) Indirect circulation air flow rates for forced-air circulation systems (in cfm), Table N1104.4.1.1(2) Direct distribution air flow rates using forced-air circulation systems (in cfm). This section provides two options specific to outdoor air supply, each of which shall meet the requirements of the code. First, when the outdoor air supply is not ducted to the forced air system, the installation of controls allowing the forced air system to provide an average circulation flow rate of not less than 0.15 cfm per square foot of the conditioned floor area per hour is permitted. Second, when the outdoor air supply is ducted to the forced-air system, the outdoor air must be tempered so that the mixed air temperature shall be either no less than 60 degrees Fahrenheit or the temperature

specified by the equipment manufacturer's installation instructions, and controls allowing the forced air circulation system to provide an average flow rate that is not less than 0.075 cfm per square foot of conditioned floor area must be installed in order to be permitted.

N1104.4.1.2 Directly ducted and individual room inlets. This proposal requires that when outdoor air is supplied directly to habitable space with airflow of 20 cfm or greater, the system shall be designed and installed to temper incoming air to not less than 40 degrees Fahrenheit measured at the point of distribution into the space.

N1104.4.1.3 Passive openings. This provision provides that when outdoor air is brought in through a passive opening, the maximum cfm of the outdoor air requirements shall be combined with the maximum makeup air requirements of the Mechanical Code, and shall be brought into the house in accordance with the Mechanical Code. The installation of controls required by Section N1104.1.1, item a, shall be installed to distribute air throughout the house.

N1104.4.2 Air flow verification. This language specifies that airflows greater than 30 cfm be tested for flow rate to verify the flow using one of several methods. This verification shall be made available to the building official upon request.

N1104.4.2.1 Airflow requirements. This language specifies that the design supply air flow limit shall not exceed 0.05 cfm per square foot of conditioned space, and that the operating exhaust air flow shall meet the requirements of Section N1104.3.1 and the Mechanical Code when the system is intended to be unbalanced.

When the system is intended to be balanced, the exhaust and supply airflows shall be within plus or minus ten percent of each other or the manufacturer's installation instructions, whichever is more restrictive.

N1104.4.3 Fans. This language specifies that when fans are used as part of the mechanical ventilation system, the fans shall be capable of delivering the designed air flow prescribed by Section N1104.2 according to HVI Standard 916. Fans are required to be designed and certified to the equipment manufacturer as capable of continuous operation at the rated cfm; surface mounted fans used with continuous ventilation shall have a maximum of 1.0 sone per HVI Standard 915; Fans used with the intermittent ventilation shall have a maximum 2.5 sone per HVI Standard 915.

The proposal exempts some requirements for forced air circulation systems and remotely mounted fans provided that the remotely mounted fan is not in a habitable space and there is at least four feet of ductwork between the fan and the grille.

N1104.4.4 Multifan systems. This section requires that each fan shall be equipped with a backdraft damper to prevent recirculation of exhaust air into another room whenever two or more exhaust fans in a dwelling unit share a common exhaust duct.

N1104.4.5 Connection to forced air circulation systems. This provision provides that air ducts

that are connected directly to the forced air circulation system can be used to meet mechanical ventilation system requirements. The proposal further provides that either tempered outdoor air may be supplied to or exhaust air may be drawn from the forced air circulation system, but not both. An exception provides that both outdoor air and exhaust air may be connected to the forced air circulation system when controls are installed to ensure that the forced air circulation system is operating whenever the mechanical ventilation system is operating or other means are provided to prevent short circuiting of fresh air according to the manufacturer's recommendations.

N1104.4.6 Dampers. This section requires that mechanical ventilation system supply and exhaust ducts shall be provided with accessible backflow dampers to minimize flow to or from the outdoors when the ventilation system is off.

N1104.4.7 Intake openings. This proposal requires that intake openings be located in accordance with the Mechanical Code, and be accessible for inspection and maintenance. Exterior air intake openings shall be located at least 12 inches above the adjoining grade level and covered with corrosion resistant screen of not less than one-fourth inch mesh, except that combination air intake and exhaust hoods may be approved by the building official when such a combination is specifically permitted by the equipment manufacturer's installation instructions.

N1104.4.8 Filtration. This proposal provides that mechanically supplied outdoor air shall have a filter with a designated minimum efficiency of MERV 4 as defined by ASHRAE Standard 52.2, and that the filter shall be located prior to the air entering the thermal conditioning components, blower, or habitable space, and shall be installed to be readily accessible and to facilitate regular service.

N1104.4.9 Noise and vibration. This section requires that system components be installed to minimize noise and vibration transmission. The installation shall be in accordance with the equipment manufacturer's installation instructions and using the materials provided by them. If the equipment manufacturer does not provide installation materials or specific installation instructions, then vibration damping materials such as rubber grommets and flexible straps shall be used when connecting fans and heat exchangers to the building structure, and isolation duct connectors shall be used to mitigate noise transmission.

N1104.4.10 Controls. This provision clarifies that there are seven methods to install mechanical ventilation controls.

N1104.4.11. Labeling. This provision provides that an appropriate permanent weather resistant identification label shall appear on outdoor air intake and exhaust air outlets. Likewise, controls shall be provided with an appropriate label using words or symbols to indicate whether the control is a ventilation system, ventilation fan, or intermittent fan.

N1104.4.12 Documentation. This section specifies that mechanical ventilation systems shall be provided with documentation that includes proper operation and maintenance instructions, and a warning regarding potential problems if the system is not operated or maintained. Additionally, a permanent warning label shall be affixed to the mechanical ventilation system if it is readily

accessible, or posted in a conspicuous readily accessible location if the mechanical ventilation system is not readily accessible.

N1104.4.13 Climatic design conditions, and Table N1104.4.13. This proposal requires that HVAC equipment be sized according to the 2005 ASHRAE *Handbook of Fundamentals*, ACCA *Manual J*, or an equivalent method. Oversizing of heating equipment may not exceed 43 percent and cooling equipment must not exceed 21 percent.

This section also provides that design conditions must be determined from Table N1104.4.13, and that an adjustment may be made by the building official to reflect local climates when they differ from the tabulated temperatures or local weather experience.

1322.2100 INCORPORATION BY REFERENCE.

This rule part incorporates Appendix F, Radon Control Methods, of the 2006 IRC, and specifies the copyright of the International Code Council.

1322.2101 SECTION AF101, SCOPE.

This rule part amends Appendix F by adding language to specifically address Minnesota's climatic conditions, and by deleting items that are not applicable in Minnesota e.g. the national radon map.

Subpart 1. General. This section has been rewritten to accurately reflect the applicable rule parts.

Subp. 2. Figure AF101. This figure is deleted in its entirety because it specifies a national radon map.

1322.2102 SECTION AF102, DEFINITIONS.

Subpart 1. General. This section has been amended to accurately reflect the rule parts to which these definitions apply.

Subp. 2. Figure AF102. The construction details have not been modified.

1322.2103 SECTION AF103, REQUIREMENTS.

AF103.1 General. The proposed rule deletes the sentence "These techniques are required in areas where designated by the jurisdiction." since these techniques are required by Minn. Stat. section 16B.61, which requires the State Building Code to include radon control methods. The individual jurisdictions that adopt the code are required to enforce those provisions of the State Building Code.

AF103.2 Subfloor preparation. The proposed rule deletes the words "future" to make the rule

easier to understand and apply. The proposed rule also adds language to specifically address conditioned crawl spaces since they are actually short basements and should follow the same portions of the rule as conditioned basements.

AF103.3 Soil gas retarder. This subsection has not been modified.

AF103.4 Entry routes. This subsection has not been modified.

AF103.4.1 Floor openings. This subsection has not been modified.

AF103.4.2 Concrete joints. This subsection has not been modified.

AF103.4.3 Condensate drains. This subsection has not been modified.

AF103.4.4 Sumps. This subsection has not been modified.

AF103.4.5 Foundation walls. This subsection has not been modified.

AF103.4.6 Dampproofing. The headnote of this subsection has been changed to read "Waterproofing/dampproofing," and the body of this section has also been changed to clarify that dampproofing or waterproofing shall be in accordance with Section R406.

AF103.4.7 Air-handling units. This subsection has not been modified.

AF103.4.8 Ducts. This subsection has been amended by deleting the reference to Section M1601 and replacing it with "Minnesota Rules, chapter 1346."

AF103.4.9 Crawl space floors. The headnote of this subsection has been changed to read "Unconditioned crawl space floors," which is also reflected in the body.

AF103.4.10 Crawl space access. The headnote of this subsection has been changed to read "Unconditioned crawl space access," which is also reflected in the body.

AF103.5 Passive submembrane depressurization system. This subsection has been amended by deleting the exception. The exception was deleted as it would make this section unenforceable since Minnesota law requires mechanical ventilation in all residential buildings.

AF103.5.1 Ventilation. This subsection has been amended to clarify that unconditioned crawl spaces be provided with vents.

AF103.5.2 Soil-gas-retarder. This subsection has not been modified.

AF103.5.3 Vent pipe. This subsection has been amended to require additional piping ten feet from the "T" in both directions to allow for more opportunities of the system to provide better and more complete depressurization of the below slab system.

AF103.6 Passive subslab depressurization system. This subsection has been amended to clearly state where the system is required.

AF103.6.1 Vent pipe. This subsection has been amended to require additional piping ten feet from the “T” in both directions to allow for more opportunities of the system to provide better and more complete depressurization of the below slab system.

AF103.6.2 Multiple vent pipes. This subsection has not been modified.

AF103.7 Vent pipe drainage. This subsection has not been modified.

AF103.8 Vent pipe accessibility. This subsection has been amended to require sufficient space for the installation of a fan in anticipation of a future conversion to an active system.

AF103.9 Vent pipe identification. This subsection has been amended to delete the words “exposed and visible” for clarity.

AF103.10 Combination foundations. This subsection has been amended to clarify that combination foundations may be connected to a single vent stack when soil gases can flow freely from all parts of the foundation to the vent stack.

AF103.11 Building depressurization. This subsection has been amended by deleting the reference to Section M1601 and replacing it with “Minnesota Rules, chapter 1346.”

AF103.12 Power source. This subsection has been amended by deleting the requirement for an alarm system since other monitoring systems are available.

REPEALER: The proposed rules have identified the following rules for repeal: Minn. R. chapters 7670, 7672, and 7674, because they become obsolete with the adoption of these rules.

EFFECTIVE DATE: The Department proposes that the amendments to these rules are effective five working days after publication of the Notice of Adoption in the *State Register*.

Minnesota Statutes § 16B.64, subdivision 8, states:

A rule to adopt or amend the state's building code is effective 180 days after the filing of the rule with the secretary of state under section 14.16 or 14.26. The rule may provide for a different effective date if the commissioner or board proposing the rule finds that a different effective date is necessary to protect public health and safety after considering, among other things, the need for time for training of individuals to comply with and enforce the rule. (Supp. 2007)

Because the Department’s Construction Codes and Licensing Division has been providing continuing education to train individuals to comply with and enforce these proposed

rules, the Commissioner found that 180 days is not necessary to protect public health and safety. Additional consideration was given to the industry's awareness of the proposed rules and their expectation that the rules be adopted and enforced as quickly as possible.

CONCLUSION

Based on the foregoing, the proposed rules are both needed and reasonable.

July 17, 2008
Date

Steve Sviggum
Steve Sviggum
Commissioner