# CHAPTER 7655
# DEPARTMENT OF PUBLIC SERVICE
# ENERGY DIVISION
# ENERGY AUDITS



## 7655.0100 DEFINITIONS.

Subpart 1. **Scope.** For the purposes of this chapter, the following terms have the meanings given them.

Subp. 2. **Accessible.** "Accessible" means, for purposes of compliance with part 7655.0400, any area that can be made more energy efficient with the installation of program measures that are not determined to be economically infeasible and which area is exposed, without the removal of permanent parts of the structure.

Subp. 3. **Department.** "Department" means the Department of Public Service.

Subp. 4. **Apartment building.** "Apartment building" means any structure containing dwelling units which are rented.

Subp. 5. **Conditioned space.** "Conditioned space" means space within a building that is heated or cooled by an energy using system.

Subp. 6. **Cooling degree day.** "Cooling degree day" means a unit, based upon temperature difference and time, used in estimating fuel consumption and specifying nominal cooling load in summer. For any one day when the mean temperature is more than 65 degrees Fahrenheit, there exist as many cooling degree days as there are Fahrenheit degrees difference in temperature between the mean temperature for the day and 65 degrees Fahrenheit.

Subp. 7. **Economic feasibility.** For the purpose of these parts, the test of economic feasibility is met when the savings in energy procurement costs, based on residential energy costs as certified by the commissioner in the State Register, or on local fuel costs, exceed the cost of acquiring and installing each standard, as amortized over the subsequent ten-year period. The costs of acquiring and installing each standard may include the costs of restoring the building to the condition that existed immediately before the standard was installed, costs to install a vapor barrier where determined necessary, and displacement costs of temporary tenant relocation where determined necessary.

Subp. 8. **Energy conservation measure.** "Energy conservation measure" means energy saving physical improvements to the building that are primarily designed to reduce energy consumption including, but not limited to, modifications to the building structure, the heating, ventilating, and air conditioning systems, and the lighting.

Subp. 9. **Caulking.** "Caulking" consists of pliable materials used to reduce the passage of air and moisture by filling small gaps located at fixed joints on a building. "Caulking" includes, but is not limited to, materials commonly known as "sealants," "putty," and "glazing compounds."

Subp. 10. **Weatherstripping.** "Weatherstripping" consists of narrow strips of material placed over or in movable joints of windows and doors to reduce the passage of air and moisture when the windows and doors are closed.

Subp. 11. **Ceiling or attic insulation.** "Ceiling or attic insulation" consists of a material primarily designed to resist heat flow which is installed between the conditioned area of a building and an unconditioned attic. Where the conditioned area of a building extends to the roof, the term "ceiling or attic insulation" also applies to such material used between the under side and upper side of the roof, or where technically feasible, on the upper side of the roof.

Subp. 12. **Wall and foundation insulation.** "Wall and foundation insulation" consists of a material primarily designed to resist heat flow which is installed within or on the walls between conditioned areas of a building and unconditioned areas of a building or the outside.

Subp. 13. **Floor insulation.** "Floor insulation" consists of a material primarily designed to resist heat flow which is installed between the first level conditioned area of a building and an unconditioned basement, a crawl space, or the ground beneath it. Where the first level conditioned area of a building is on a ground level concrete slab, the term "floor insulation" also means such material installed around the perimeter of or on the slab. In the case of manufactured homes, the term "floor insulation" also means skirting to enclose the space between the building and the ground.

Subp. 14. **Storm or thermal window.** "Storm or thermal window" consists of:

A. a window or glazing material placed outside or inside an ordinary or prime window, creating an insulating air space, to provide greater resistance to heat flow than the prime window alone; or

B. a window unit with improved thermal performance through the use of two or more sheets of glazing material affixed to a window frame to create one or more insulated air spaces. It may also have an insulating frame and sash.

Subp. 15. **Storm or thermal door.** "Storm or thermal door" consists of:

A. a second door, installed outside or inside a prime door, creating an insulating air space;

B. a door with enhanced resistance to heat flow through the glass area created by affixing two or more sheets of glazing materials; or

C. a primary exterior door with an R value of at least two.

Subp. 16. **Rim joist insulation.** "Rim joist insulation" consists of a material primarily designed to resist heat flow which is installed along either side of the rim joist.

Subp. 17. **Fireplace stove.** "Fireplace stove" means a chimney connected, solid fuel burning stove having part of its fire chamber open to the room.

Subp. 18. **Heating degree day.** "Heating degree day" means a unit, based upon temperature difference and time, used in estimating fuel consumption and specifying nominal heating load of a building in winter. For any one day, when the mean temperature is less than 65 degrees Fahrenheit, there exist as many heating degree days as there are Fahrenheit degrees difference in temperature between the mean temperature for the day and 65 degrees Fahrenheit.

Subp. 19. **Positive shutoff.** "Positive shutoff" means a manual shutoff device which can be utilized to produce a seal to inhibit the flow of air when a fireplace or fireplace stove is not operating. Examples are damper in fireplace, damper at top of flue, damper in connector pipe, or doors (glass or other) on fireplace or fireplace stove.

Subp. 20. **"R" value.** "R" value means the measure of resistance to heat flow through a material or the reciprocal of the heat flow through a material expressed in British thermal units per hour per square foot per degree Fahrenheit at 75 degrees Fahrenheit mean temperature.

Subp. 21. **Residence.** "Residence" means any dwelling let to another used for habitation during all or a portion of the months November through April. A residence may be part of a multiunit building, multifamily dwelling, or multipurpose building, but "residence" does not include buildings such as hotels, hospitals, motels, dormitories, sanitariums, nursing homes, schools and other buildings used for educational purposes, or correctional institutions. Each dwelling unit in a rental building is a residence. A manufactured home as defined in Minnesota Statutes, section 168.011, subdivision 8, is a residence for purposes of these parts.

Subp. 22. **Rim joist.** "Rim joist" means that part of the residential structure between the top of the foundation wall and the subfloor immediately above the perimeter of the floor joists.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

### 7655.0120 AUTHORITY AND PURPOSE.

Subpart 1. **Authority.** The department's authority to adopt these parts is contained in Minnesota Statutes, sections 216C.09, paragraph (h); 216C.10, paragraph (a); and 216C.27.

Subp. 2. **Purpose.** The purpose of this chapter is to establish a program requiring mandatory minimum energy efficiency standards for rental buildings, procedures for energy evaluations, and the certification of evaluators.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9,10 subd 1*

## QUALIFICATION PROCEDURES FOR EVALUATORS

### 7655.0200 DISCRIMINATION PROHIBITED.

No person shall be denied the right to become an evaluator on the basis of race, religion, nationality, creed, sex, age or sexual preference.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

### 7655.0210 TRAINING.

Subpart 1. **Requirement.** Except as provided in subpart 2, no person is eligible for certification under part 7655.0220 unless he or she has first participated in a training course which has been approved by the department and which covers the subject matter tested in the evaluator certification examination.

Subp. 2. **Exception.** The following persons may take an appropriate department approved orientation session, in lieu of the requirements of subpart 1:

A. any HED evaluator certified before July 1, 1981;

B. any person successfully completing an approved 30 hour training course for the HED program prior to July 1, 1981;

C. registered architects and registered engineers with work experience in energy auditing or the design of institutional, commercial, residential, or industrial buildings;

D. any person who has six months' energy auditing experience and who has completed 25 energy audits for a nonprofit organization or regulated utility;

E. members of the American Institute of Real Estate Appraisers, the Society of Real Estate Appraisers, the Independent Fee Appraisers, or other associations determined by the department to have applicable training requirements for their members;

F. certified evaluators for Truth in Housing Programs;

G. building officials certified by the Building Codes Division of the Minnesota Department of Administration.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0220 CERTIFICATION.**

Only those persons who satisfy all of the following conditions shall be certified:

A. All persons shall take and pass a certification examination conducted by the department. The certification examination must test for the following qualifications:

(1) a general understanding of the three types of heat transfer and the effects of temperature and humidity on heat transfer;

(2) a general understanding of residential construction terminology and components;

(3) a general knowledge of the operation of the heating and cooling systems used in residential buildings, including the need and provision for combustion air;

(4) a general knowledge of the different types of each applicable program measure, of the advantages and disadvantages and applications of each, and of the DOE installation standards;

(5) the capability to conduct the energy evaluation including: a working knowledge of energy conserving practices, the ability to determine the applicability of each of the program measures, and proficiency in the auditing procedures for each applicable program measure established in parts 7655.0300 and 7655.0310;

(6) a working ability to calculate the steady state efficiency of furnaces or boilers; and

(7) a working knowledge of building and fire codes related to the installation and safety of wood burning appliances.

B. All persons shall submit a $50 certification fee to the department. However, no certification fee may be charged for certified municipal building officials who are directly employed by a municipality as defined in Minnesota Statutes, section 16B.60, subdivision 3; or for employees of public housing agencies as defined in Minnesota Statutes, section 462.421, subdivision 12; or for employees of private nonprofit community based organizations, or regulated utilities, when the evaluations are performed as part of the employee's normal job responsibilities. No certification fee may be charged for those persons upgrading their certification who were certified prior to July 1, 1981.

C. All persons shall provide evidence satisfactory to the department of liability and of errors and omissions insurance. The minimum value of protection in each category must be $50,000, and the insurance must be of the "occurrence" variety where coverage is based on the date when the evaluation is made. A "claims made" policy with a reporting endorsement of at least five years is also acceptable. Coverage is not required for evaluators who are employed by municipal governments or public housing agencies and who perform evaluations as part of their normal job responsibilities. Certified evaluators who have provided a bond to the state as required by the Building Code Division of the Department of Administration are not required to obtain the protection required by this paragraph until that bond expires. In addition, each insurance policy must:

(1) name the state of Minnesota as a coinsured party; and

(2) be written by a corporate insurer licensed to do business in the state of Minnesota, or licensed in accordance with Minnesota Statutes, sections 60A.195 to 60A.209.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0230 CERTIFICATION EXAMINATIONS.**

Examinations must be conducted by the department and offered at the following times:

A. within two days after the completion of each state sponsored training course or orientation session; or

B. once a month, until June 1982, with a minimum of two examinations per year afterward.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0240 OTHER QUALIFIED PERSONS.**

The department may certify other qualified persons to conduct evaluations pursuant to part 7655.0400, subpart 3, standard numbers 14 and 15. These persons shall be certified only if they:

A. have passed the certification examination provided at part 7655.0220, item A;

B. have paid the certification fee provided at part 7655.0220, item B;

C. have fulfilled the requirements for insurance coverage provided at part 7655.0220, item C;

D. have taken additional training that includes the following subject matter:

(1) the operation of the various types of heating systems and their controls for multifamily buildings;

(2) the operation of heating distribution systems for multifamily buildings; and

(3) retrofit strategies for improving the energy efficiency of heating and distribution systems in multifamily buildings; and

E. have passed a certification examination which tests the qualifications needed to conduct an evaluation pursuant to part 7655.0400, subpart 3, standard numbers 14 and 15.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0250 RECERTIFICATION OF EVALUATORS.**

Subpart 1. **Term of certification.** Certification is valid for one year.

Subp. 2. **Recertification procedure.** Each year, each evaluator shall be recertified. The following procedures must be completed in order for an evaluator to be recertified:

A. Prior to the date of certificate expiration, the evaluator shall attend a recertification course, as required by the department. Successful completion of this course shall recertify the evaluator for the next year. Evaluators not completing the recertification course prior to the expiration date of their certification shall be recertified by completing the recertification course and successfully retaking the certification examination.

B. The recertification course requirements for evaluators must be eliminated for any particular year if the department determines that no changes were made in the program that year. Certification must then be automatically renewed.

C. Persons requesting recertification shall pay a $25 fee to the energy division of the department.

D. This recertification must occur annually, for the life of the program.

Subp. 3. **Personnel from other states.** Any person who is certified to conduct residential conservation service audits in another state is not required to take the training course established in part 7655.0210, subpart 1, but is required to pass the evaluator certification examination.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0260 DECERTIFICATION OF EVALUATORS.**

Subpart 1. **Insurance.** Certification shall be automatically revoked upon receipt of written notice by the department of cancellation or expiration of the insurance protection required in part 7655.0220, item C.

Subp. 2. **Training.** Certification shall be revoked for any HED evaluator certified before July 1, 1981, who does not successfully complete the appropriate training course required in part 7655.0210, and the certification examination required in part 7655.0220, item A.

Subp. 3. **Recertification.** Certification shall be revoked for any evaluator not meeting the recertification requirements of part 7655.0250.

Subp. 4. **Nonsufficient fund checks.** Certification shall be revoked for any evaluator whose check or draft issued for payment of the certification fee is returned for nonsufficient funds.

Subp. 5. **Wrongful acts.** Certification must be revoked when reasonable evidence indicates an undisclosed conflict of interest, a violation of these parts, unethical practices, or negligent performance of duties as an evaluator. In any of these instances, the department will, if requested, provide a review to determine whether the revocation was proper. This review must consist of the following procedures:

A. The evaluator shall make a written request for a review to the department.

B. The director of the office of conservation shall determine a time to review the request. The evaluator may present testimony in person or in writing. The evaluator may present witnesses on the evaluator's behalf. Department staff may present written or oral testimony, as well as witnesses.

C. The director of the office of conservation shall make a judgment based on the information presented in the review hearing. That judgment shall be presented in writing to the evaluator within three working days of the review.

Subp. 6. **Failure to report.** Certification must be revoked if the reports required in part 7655.0300 are not submitted to the department as required.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0270 CALCULATION PROCEDURES.**

The procedures in parts 7655.0280 and 7655.0290 must be the basis for calculating energy savings for each standard.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0280 ENERGY CONSERVING MEASURES.**

Subpart 1. **General energy savings equations.** The following equations shall be used to calculate energy savings for the practices and measures listed below, except for those that are already termed in E.

Equation number 1.

$$\Delta E = \frac{\Delta H \times D \times 20.4}{N \times V}$$

Where:

$\Delta E$ = The quantity of annual energy savings in the appropriate energy units, such as hundreds of cubic feet of natural gas, gallons of fuel oil, or kilowatt hours of electricity.

$\Delta H$ = The difference in design heat loss per degree Fahrenheit between the improved condition and the existing condition for infiltration or thermal transmission or both. Equations for calculating H are listed in subsequent subsections.

D = The normalized annual degree days as published by the National Oceanic and Atmospheric Administration and found in the Home Energy Disclosure Technical Manual, published by the Minnesota Energy Agency, November, 1981.

N = The seasonal operating efficiency of the heating system.

V = The heating value of the fuel type, consistent with $\Delta E$ and $\Delta H$.

Subp. 2. **Caulking.** Equation number 2.

$$\Delta H = .018 \times \Delta I \times Vol$$

Where:

$\Delta I$ = Change in infiltration rate in air changes per hour.

Vol = Volume of heated space in cubic feet.

Subp. 3. **Weatherstripping.** Use equation number 2.

Subp. 4. **Furnace efficiency modifications.**

A. Replacement furnaces or boilers. Equation number 3.

$$\Delta E = E_h \frac{1 - N_o}{N_1}$$

B. Furnace replacement burner. Equation number 4.

$$\Delta E = .14\ E_h$$

C. Flue opening modifications. Equation number 5.

$$\Delta E = .08\ E_h.$$

D. Install electronic ignition system.

(1) If pilot is turned off during the summer. Equation number 6.

$$\Delta E = \frac{3600F_p}{V}$$

(2) If pilot is left on in the summer. Equation number 7.

$$\Delta E = \frac{7300F_p}{V}$$

where:

$E_h$ = Total annual energy used for space heating, in units of fuel.

$N_o$ = The seasonal operating efficiency of the existing heating system.

$N_1$ = The seasonal operating efficiency of the proposed heating system.

$F_p$ = Rate at which pilot uses energy, in Btu's per hour. It is typically 800 to 1,000 Btu's per hour.

V = Heating value of the fuel type in Btu per unit of fuel.

Subp. 5. **Replacement central air conditioner.** Equation number 8.

$$\Delta E = E_c \left(1 - \frac{PSE}{NSE}\right)$$

where:

$E_c$ = Annual energy used by existing central air conditioner, in units of fuel.

PSE = Present seasonal efficiency.

NSE = New (proposed) seasonal efficiency.

Subp. 6. **Ceiling insulation.** Equation number 9.

$$\Delta H = \left(\frac{1}{R_0} - \frac{1}{R_1}\right) A$$

where:

$R_o$ = Total R value of existing insulation and existing construction materials in present condition.

$R_1$ = Total R value of proposed condition to include total recommended R value of the insulation and construction materials.

A = Area for which additional insulation is being proposed.

Subp. 7. **Wall insulation.** Use Equation number 9 for above grade walls.

Subp. 8. **Floor insulation.** Use Equation number 9.

Subp. 9. **Duct insulation.** Equation number 10.

$$\Delta E = \frac{\left(\frac{1}{R_0} - \frac{1}{R_1}\right)(T_2 - T_1)\, A \times HRS}{NV}$$

where:

$R_o$ = The total R value of the ducts before improvement.

$R_1$ = The total R value of the ducts after improvement to include total recommended R value of the insulation and construction materials.

$T_2$ = Average temperature of air inside ducts during an on cycle of the heating system.

$T_1$ = Average temperature of the unconditioned space the ducts pass through.

A = Duct area for which insulation is proposed.

HRS = Number of hours the heating system operates in a heating season.

N = Seasonal operating efficiency of the heating system.

V = Heating value of fuel in Btu per unit of fuel.

Subp. 10. **Pipe insulation.** Equation number 11.

$$\Delta E = \frac{(Q_1 - Q_0)\, L \times HRS}{NV}$$

where:

$Q_1$ = Heat loss in Btu/hr. ft. before improvement.

$Q_o$ = Heat loss in Btu/hr. ft. after improvement.

L = Length of uninsulated pipes in unconditioned space.

HRS = Number of hours per year the heating system operates in a heating season.

N = Seasonal operating efficiency of the heating system.

V = The heating value of the fuel in Btu per unit of fuel.

Subp. 11. **Water heater insulation.**

A. If water heater is in an unconditioned space. Equation number 12.

$$\Delta E = \frac{8760A\left(\frac{1}{R_0} - \frac{1}{R_1}\right)(T_w - T_a)}{N_r V}$$

B. If water heater is in a conditioned space. Equation number 13.

$$\Delta E = \frac{H \times A \times \left(\frac{1}{R_0} - \frac{1}{R_1}\right)(T_w - T_a)}{N_r V}$$

where:

$A$ = Area of water heater to be insulated.

$R_o$ = Total R value of the existing insulation and existing construction materials of the water heater before improvement.

$R_1$ = Total R value of the water heater after improvement to include total recommended R value of the insulation and construction materials.

$T_w$ = Hot water temperature.

$T_a$ = Average air temperature of area surrounding water heater.

$N_r$ = Recovery efficiency of water heater.

$V$ = Heating value of fuel type in Btu per unit of fuel.

$H$ = Number of hours per year that the outside temperature is above 65 degrees Fahrenheit.

Subp. 12. **Storm and thermal windows.** Equation number 14.

$$\Delta H = \left(\frac{1}{R_0} - \frac{1}{R_1}\right) \times A$$

where:

$R_o$ = The R value of the existing window assembly.

$R_1$ = The R value of the proposed window assembly.

$A$ = The area of the window assembly.

Subp. 13. **Storm and thermal doors.** Use equation number 14 where:

$R_o$ = The R value of the existing door assembly.

$R_1$ = The R value of the proposed door assembly.

$A$ = The area of the door assembly.

Subp. 14. **Heat reflective and heat absorbing window or door material.** Equation number 15.

$$\Delta E = \frac{A \times F_{ss} \times F_{es}}{N_{ac}}$$

where:

$A$ = Area of glazing.

$F_{ss}$ = Summer shading factor.

$F_{es}$ = Glazing orientation factor.

$N_{ac}$ = Seasonal efficiency of the air conditioning system.

Subp. 15. **Load management.** Each utility offering such system will provide $\Delta E$ according to the particular system that the utility offers.

Subp. 16. **Clock thermostats.** Energy savings will be given for a single eight hour night setback.

Equation number 16a: $\Delta E = .07E_h$ for five degrees Fahrenheit setback.

Equation number 16b: $\Delta E = .10E_h$ for ten degrees Fahrenheit setback.

Equation number 16c: $\Delta E = .11E_h$ for 15 degrees Fahrenheit setback.

where:

$E_h$ = Total annual energy used for space heating, in units of fuel.

Subp. 17. **Solar domestic hot water.** Equation number 17.

$$\Delta E = SSF \times E_{hw}$$

where:

SSF = Solar saving fraction = fraction of hot water supplied by the solar system. (Target SSF = .7)

$E_{hw}$ = Annual energy used for heating domestic hot water, in millions of Btu's.

Subp. 18. **Passive solar systems.**

A. Direct gain glazing, indirect gain - water well storage, indirect gain - trombe wall storage.

Energy savings for 100 square feet of double glazing with R-8 night insulation: equation number 18.

$$\Delta E = \frac{8 \times PSF \times F_o}{N}$$

B. Indirect gain - thermosiphon air panel. Energy savings for 100 square feet of panels: equation number 19.

$$\Delta E = \frac{3 \times PSF \times F_o}{N}$$

C. Sunspace systems. Energy savings for 100 square feet of vertical double glazing: equation number 20.

$$\Delta E = \frac{4 \times PSF \times F_o}{N}$$

where:

$\Delta E$ is in millions of Btu.

PSF = Prime Solar Fraction, estimated by auditor.

F = Orientation Factor, from tables.

N = Heating system seasonal efficiency.

D. Window heat gain retardants. Same as equation number 14.

Subp. 19. **Wind energy devices.**

A. Systems providing utility grade power that can be sold to the electric utility when the system provides excess power. A system will be chosen with an Annual Wind System Output (AWSO) equal to one-half the current annual electric use. Equation number 21a.

$$\Delta E = 1.0 \text{ AWSO}$$

B. Systems providing variable voltage power for heating use only. A system will be chosen with an Annual Wind System Output (AWSO) equal to one-half of the annual heat supplied by the space heating system. Equation number 21b.

$$\Delta E = 1.0 \text{ AWSO}$$

where:

AWSO = Annual Wind System Output in kwh.

Subp. 20. **Replacement solar swimming pool heaters.** Equation #22.

$$\Delta E = SSF \times E_{sp}$$

where:

SSF = Solar saving fraction = fraction of swimming pool heat supplied by the solar system. (Target SSF = .5)

$E_{sp}$ = Energy used to heat the pool for the months of May through September.

Subp. 21. **Install positive shutoffs for all fireplaces or fireplace stoves.** Equation number 23.

$$\Delta H = 1.08 (Q_o - Q_1) A$$

where:

$Q_o$ = The infiltration value in cubic feet per minute per square foot for the existing condition before improvement.

$Q_1$ = The infiltration value after improvement with a positive shutoff.

A = The cross sectional area of the flue or connector in square feet.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0290 ENERGY INDEX.**

Energy Index = E x $F_w$

Where:

E is energy content of all fuel (including electricity) used during the months of November through April, in Btus.

$F_w$ is a weather adjustment factor.

It is the ratio of the number of degree days in an average heating season (November 1 through April 30) to the number of degree days for the heating season preceding the calculation.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *L 1987 c 312 art 1 s 9*

## CONDUCTING THE EVALUATION

**7655.0300 DISCLOSURE REPORTS.**

All evaluators shall use a disclosure report approved by the department. Copies of completed disclosure reports must be retained by evaluators for at least five years. The reports must be available for review by the department. Copies of audits conducted by registered professional engineers, architects, or other persons qualified by the department under part 7655.0400, subpart 3, standard numbers 14 and 15 must be submitted to the department within 14 days for review and approval.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0310 GENERAL DUTIES OF EVALUATORS, REGISTERED PROFESSIONAL ENGINEERS, ARCHITECTS, AND OTHER APPROVED QUALIFIED PERSONS.**

Evaluators, registered professional engineers, architects, and other approved qualified persons shall estimate energy savings and installation costs of each applicable standard using the calculation procedures in parts 7655.0280 and 7655.0290. An applicable standard is any standard which can be installed in the residence to meet the minimum energy efficiency standards in part 7655.0400. Evaluators, registered professional engineers, architects, and other approved qualified persons shall:

A. Inspect and take actual measurements of the building shell, and inspect the space heating, space cooling, and water heating equipment. The inspection must include all common areas and at a minimum the following number of units for the building being evaluated. The random selection of units

to be included in the sample of units inspected must be done by the evaluator, registered professional engineer, architect, and other approved qualified person.

| Size of building | Minimum number of units included in inspection sample |
|---|---|
| 1 to 4 units | all units |
| 5 plus units | 5 units + 3 percent of total number of units in the building |

B. Base economic calculations on local fuel prices, or on those prices provided by the department, as published in the State Register.

C. Base economic calculations for materials and installation of measures on prices provided by the department. Prices must be made available to interested persons by:

(1) publication in the State Register by the department of the most recent contractors and suppliers price survey; or

(2) direct mailing by the department of the most recent price survey to certified evaluators; or

(3) if the owner contends that the prices provided by the department are not representative of actual costs that would be incurred by installing the measure to comply with the standards, the owner shall obtain at least three bids from bona fide contractors indicating the costs of installing that measure. The lowest bid must then be used in determining whether the standard is economically infeasible.

D. Base any cost and savings estimate for any applicable furnace efficiency modification to a gas or oil furnace or boiler on an evaluation of the steady state efficiency of the heating system.

(1) For oil furnaces or boilers, the steady state efficiency shall be derived by a flue gas analysis of the measured flue gas temperature and carbon dioxide content.

(2) For gas furnaces or boilers, the steady state efficiency shall be derived from manufacturer's design data. If the manufacturer's design data are not available at the time of inspection, then a flue gas analysis, as described in subitem (1) must be performed.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0320 PRESENTATION OF EVALUATION AND AUDIT RESULTS.**

A copy of the disclosure report or audit must be provided to the owner or the owner's agent. The disclosure report or audit must, at a minimum, contain the following information:

A. An estimate of the total cost for materials and labor of installation by a contractor of each applicable standard addressed in the evaluation.

B. An estimate of the savings in energy costs which would occur during the first year from the installation of each applicable standard addressed by the evaluation.

C. An estimate of the payback period, measured in years, from the energy cost savings of each of the applicable standards installed individually.

D. A disclosure using the following language or similar language: "The procedures used to make these estimates are consistent with the department's criteria for energy evaluations. However, the actual installation costs you incur and energy cost savings you realize from installing these standards may be somewhat different from the estimates contained in this disclosure report or

audit. Although the estimates are based on measurements of your building, they are also based on assumptions which may not be appropriate for your building."

E. A listing of the units of the building that were actually inspected and the date of the inspection, as described in part 7655.0310, item A.

F. The name, address, and telephone number of the person who conducts the inspection and who completed the disclosure report or audit.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

**7655.0330 PROHIBITIONS.**

The evaluator, registered professional engineer, architect, or other approved qualified person shall:

A. not recommend any supplier or contractor to any owner;

B. not endorse the use of specific brand names of materials or products, persons, firms, or contractors which may be used to meet any specific standard;

C. not make any statements relating to the standards which may be interpreted as an endorsement of any specific material or product;

D. not exclude any applicable standards in the presentation of the audit to the owner;

E. provide the owner with a written statement of any interest which he or she or his or her employer has, directly or indirectly, in the sale or installation of any energy conservation measure; and

F. not conduct an evaluation of a building in which he or she has an ownership interest or is employed (other than to conduct the evaluation) by any person having an ownership interest in the building.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9*

## MINIMUM ENERGY EFFICIENCY STANDARDS

**7655.0400 ENERGY EFFICIENCY STANDARDS.**

Subpart 1. **Compliance.** Under Minnesota Statutes, section 216C.27, subdivisions 1, 2, and 3, all residences constructed prior to January 1, 1976, which are renter occupied during all or a portion of the months of November through April must be in compliance with each applicable standard by the date shown in subpart 2, unless those standards are determined to be economically infeasible. All building owners shall initially determine the economic feasibility of these standards using the calculation procedures adopted by the department. Those determinations are subject to review and final determination by the department.

Subp. 2. **Applicable energy efficiency standards.**

| Type of building | Date of applicability | | |
|---|---|---|---|
| | January 1, 1980 Standards | July 1, 1983 Standards | July 1, 1985 Standards |
| Single family | 1-2 | 1, 2 or 13, 3-8 | 1, 2 or 13, 3, 4, 5, 9, 10, 11, 12 |
| Manufactured home | 1-2 | 1, 2 or 13, 3-8 | 1, 2 or 13, 3, 4, 5, 9, 10, 11, 12 |
| 2-4 unit building | 1-2 | 1, 2 or 13, 3-8 | 1, 2 or 13, 3, 4, 5, 9, |

| | | | |
|---|---|---|---|
| | | | 10, 11, 12 |
| 5-11 unit building | 1-2 | 1, 3, 5, 6, 7, 8, and 2 or 13; OR 1, 3, 15, and 2 or 13 | 1, 3, 5, 10, 11, 12, and 2 or 13; OR 1, 3, 15, and 2 or 13 |
| 12 plus unit building | 1-2 | 1, 3, 5, 6, 7, 8, and 2 or 13; OR 1, 3, 14, and 2 or 13 | 1, 3, 5, 10, 11, 12, and 2 or 13; OR 1, 3, 14, and 2 or 13 |

Subp. 3. **Enumeration.** The following are the minimum energy efficiency standards for existing residences constructed prior to January 1, 1976, that are renter occupied. The following standards shall be used as indicated in subpart 2.

1. Install weatherstripping between exterior operable window sash and frames and between exterior doors and frames. Weatherstripping is not required on storm doors or storm windows.

2. Caulk, gasket, or otherwise seal accessible exterior joints between foundation and rim joist; around window and door frames; between wall and roof; between wall panels; at penetrations for utility services through walls, floors, and roofs; and at all other openings in the exterior envelope.

3. Install storm windows on all single glazed exterior window units enclosing conditioned space.

4. Install storm doors on all exterior door openings into conditioned spaces unless a single door, enclosed porch, vestibule, or other appurtenance provides a double door effect or provides an "R" value of two or more.

5. Install positive shutoffs for all fireplaces or fireplace stoves, unless an existing damper provides a positive shutoff.

6. Install insulation in accessible attics or ceilings to achieve a minimum total "R" value of the insulation of R-19. If there is insufficient space for the installation of the recommended "R" value, then the standard must be based on installing insulation to fill the available space while providing for appropriate ventilation.

7. Install insulation in all accessible rim joist areas to achieve a minimum total "R" value of the insulation of R-11. If there is insufficient space for the installation of the recommended "R" value, then the standard must be based on installing insulation to fill the available space.

8. Install insulation in or on accessible walls and floors enclosing conditioned spaces to achieve a minimum total "R" value of the insulation of R-11. If there is insufficient space for the installation of the recommended "R" value, then the standard must be based on installing insulation to fill the available space.

9. Modify the existing heating system so that it operates at a minimum steady state efficiency of 75 percent as demonstrated through a flue gas analysis provided for in part 7655.0310, item D.

10. Install insulation in all ceilings or attics between conditioned and unconditioned spaces to achieve a minimum total "R" value of the insulation R-38. If there is insufficient space for the installation of the recommended "R" value, the standard must be based on installing insulation to fill the available space while providing for appropriate ventilation.

11. Install insulation in all rim joist areas to achieve minimum total "R" value of the insulation of 19, unless the R value of the existing insulation is R-11 or more. If there is insufficient space for the installation of the recommended "R" value, the standard must be based on installing insulation to fill the available space.

12. Install insulation in or on all walls and floors that enclose conditioned spaces to achieve a minimum total "R" value of the insulation of R-11. Walls must include foundation walls of basements, cellars, or crawl spaces. Insulation installed on the exterior of the foundation wall must extend down to two feet below grade level. Insulation installed on the interior or in the foundation wall must be installed from the bottom of the rim joist to the foundation slab or floor. If there is insufficient space for the installation of the recommended "R" value, the standard must be based on installing insulation to fill the available space.

13. Caulk, gasket, or otherwise seal interior joints between foundation and rim joist, around window and door frames, between wall and ceiling, at joints between wall and trim boards, at cracks on interior surfaces of walls, and at utility penetrations.

14. Install energy conservation measures that have had or are predicted to have a cumulative energy consumption savings of 25 percent. These energy conservation measures must be designated in an energy audit conducted by a registered professional engineer or architect or other person determined qualified by the department. The annual energy consumption savings of 25 percent must be based on verified energy consumption, normalized to the average number of heating degree days reported by the nearest National Oceanographic and Atmospheric Administration recording station, for any heating season from 1973-1974 to the present. The energy audit must indicate whether the building complies with standards 1, 2, or 13, and 3 of this subpart. If the building is not in compliance with those standards, the predicted energy consumption savings resulting from the installation of those standards may be included in the 25 percent cumulative energy consumption savings.

15. Install energy conservation measures that have had or are predicted to have cumulative energy consumption savings of 30 percent. These energy conservation measures must be designated in an energy audit conducted by a registered professional engineer or architect or other person determined qualified by the department. The annual energy consumption savings of 30 percent must be based on verified energy consumption, normalized to the average number of heating degree days reported by the nearest National Oceanographic and Atmospheric Administration recording station, for any heating season from 1973-1974 to the present. The energy audit must indicate whether the building complies with standards 1, 2, or 13, and 3 of this subpart. If the building is not in compliance with those standards, the predicted energy consumption savings resulting from the installation of those standards may be included in the 30 percent cumulative energy consumption savings.

**Statutory Authority:** *MS s 216C.09; 216C.10; 216C.27*

**History:** *9 SR 252; L 1987 c 312 art 1 s 9,10 subd 1*

**7655.0410 GOOD CAUSE.**

As required by Minnesota Statutes, section 216C.27, subdivision 4b, "good cause" means any one of the following:

A. That the installation of a program measure to comply with a standard in part 7655.0400 is economically infeasible as defined in part 7655.0100, subpart 7.

B. That the installation of a program measure to comply with a standard in part 7655.0400 is technologically infeasible. Technological infeasibility means that the installation of the measure would threaten the structural integrity of the building.

C. That the installation of a program measure to comply with a standard in part 7655.0400 would necessarily violate the building's aesthetic or historic value.

**Statutory Authority:** *MS s 216C.27 subds 4a,4b*

**History:** *10 SR 391; L 1987 c 312 art 1 s 9,10 subd 1*

**7655.0420 FINE SCHEDULE.**

If an administrative law judge finds that an owner or an owner's agent has not demonstrated good cause for failure to comply with the minimum mandatory energy efficiency standards, the judge shall assess the following penalties:

A. For a one to four unit building, an immediate fine of $100 plus $200 each month beginning 120 days after the finding of failure to show good cause, until the owner demonstrates to the administrative law judge that he or she has complied with the standards. If a person certified to conduct evaluations under this chapter certifies that an owner complies with the applicable standards, the judge shall consider the certification as proof of compliance by the owner.

B. For a building with five or more units, an immediate fine of the greater of $10 per unit or $100, up to a maximum of $500. The maximum fine of $500 is also the maximum fine for a residential complex situated on one or more contiguous parcels of land under common ownership. In addition, a fine each month of two times the amount assessed beginning 180 days after the finding of failure to show good cause, until the owner demonstrates to the administrative law judge that he or she has complied with the standards. If a person certified to conduct evaluations under this chapter certifies that an owner complies with the applicable standards, the judge shall consider the certification as proof of compliance by the owner.

**Statutory Authority:** *MS s 216C.27 subds 4a,4b*

**History:** *10 SR 391; L 1987 c 312 art 1 s 9*