

## Part 508 Green Residential Building Program

### Section 508.1 Scope and Purpose

(a) The New York State Legislature has found that the design, construction, and maintenance of residential buildings have significant impacts on the environment and natural resources. The provisions of this Part shall apply to the construction and substantial renovation of residential buildings with less than twelve dwelling units incorporating design and building techniques intended to: (i) promote smart growth and smart site planning; (ii) reduce greenhouse gas emissions; (iii) achieve energy efficiency and reduce energy consumption; (iv) facilitate the incorporation of environmentally responsible products; (v) promote the efficient use of natural resources; (vi) promote the conservation of materials and resources; (vii) reduce waste; and (viii) create a healthy indoor living environment.

(b) The purpose of this Part is to promote the construction and renovation of "green" or "sustainable" residential buildings through the creation of a green residential building program to provide incentives for the use of design and construction techniques that facilitate, promote, or achieve energy efficiency and reduced emissions, smart planning, and a healthy indoor living environment, and incorporate products that are environmentally responsible, conserve natural resources, and reduce waste.

### Section 508.2 Definitions

For purposes of this Part, the following terms shall mean:

(a) "ACCA Manual D" means the Air Conditioning Contractors of America Manual D - Residential Duct Systems.

(b) "Air barrier" means the system of materials designed and constructed to control unintended airflow into and out of a building enclosure. In a residential building with multiple dwelling units, "air barrier" includes common walls that separate conditioned air between adjacent dwelling units.

(c) "Air changes per hour (ACH)" means the number of times per hour that the complete air volume in a building is exchanged with outside air when a blower door depressurizes the building.

(d) "Air sealing measures" means physical barriers including, but not limited to, caulks, foams, gaskets, weather stripping, door sweeps, or residential building wraps that seal holes and seal penetrations from, including, but not limited to, piping, wiring, lighting fixtures, or ducts, or between seams, into or within the residential building.

(e) “Air Source Heat Pump” means a space conditioning system that uses air as both a heat source and sink, and uses a reversible refrigeration cycle to provide either heating or cooling.

(f) “Application” means a request by an Owner for an award of a Program incentive containing the information required by this Part.

(g) “Authority” means the New York State Energy Research and Development Authority.

(h) “Blower door” means a device consisting of a fan, a removable panel, and gauges that can be placed in a doorway and used to depressurize a residential building so that air changes per hour can be measured and air leaks in the building envelope can be located.

(i) “Boiler” means a self-contained device that uses less than 300,000 Btus per hour energy input, that supplies low-pressure steam or hot water for space heating, and that may provide hot water for domestic or other uses.

(j) “Btu” means British thermal unit.

(k) “Building envelope” means a residential building’s shell, including the exterior walls, floor, and roof assembly.

(l) “Ceiling fan” means a non-portable device attached to and suspended from the ceiling that circulates air through the rotation of fan blades.

(m) “Central air conditioner” means a device, other than a packaged terminal air conditioner, that: (1) is powered by single phase electric current, (2) is air cooled, (3) is rated below 65,000 Btus per hour, (4) is not contained within the same cabinet as a furnace, the rated capacity of which is above 225,000 Btus per hour, and (5) consists of a cooling unit only.

(n) “CFL” means compact fluorescent lamp.

(o) “Closed Loop Ground Source Heat Pump” means a ground heat exchanger in which the heat transfer fluid is permanently contained in a closed system.

(p) “Combination ventilation fan” means a device that includes a ventilating fan and either a light source for general lighting or a night light.

(q) “Combined Annual Efficiency (CAE)” means the overall efficiency of a heating system in providing both space heating and water heating.

(r) “Compact dishwasher” means a dishwasher with a capacity of less than eight place settings (consisting of 1 cup and saucer, 1 dinner plate, 1 bread and butter plate, 1 dessert bowl,

liced tea glass, 1 knife, 1 spoon, and 2 forks) and six serving pieces (consisting of 1 serving platter, 2 serving bowls, 1 serving cold meat fork, and 2 serving spoons).

(s) “Conditioned space” means space within the residential building’s air barrier and thermal envelope that is served by a heating system and may include a cooling system.

(t) “Direct expansion ground source heat pump system” means a geothermal heat pump system in which the refrigerant is circulated in pipes buried in the ground and includes all associated indoor and outdoor equipment.

(u) “Dwelling unit” means a single, independent unit for providing permanent living, sleeping, eating, cooking, and sanitation facilities, for one or more persons to perform life activities.

(v) “Electronically commutated motor (ECM)” means a brushless, direct current motor which uses an electronic controller to vary fan rotor speed and direction by sequentially supplying direct current to the motor windings.

(w) “Energy Factor (EF)” means the ratio of useful energy output from a domestic water heater to the total amount of energy delivered to the domestic water heater.

(x) “Expanded Home Energy Rating System (HERS) Score” means a numeric comparison of the relative energy efficiency between a newly constructed or renovated residential building and a referenced residential building meeting only the minimum requirements of the Energy Conservation Construction Code of New York (19 NYCRR Part 1240); an “Expanded HERS score” is expressed on an ascending scale, from 70 to 100.

(y) “First-hour rating” means the amount of hot water in gallons per hour that a storage domestic water heater can supply when starting with a tank full of hot water.

(z) “Flame retention burner” means an oil burner with a steady-state efficiency over 80 percent.

(aa) “Furnace” means a device with a heat input rate of less than 225,000 Btus per hour to produce forced hot air; a “furnace” includes a burner(s), heat exchanger(s), blower(s), and connections to heating ducts.

(bb) “Green residential building standards” means the standards, guidelines, rating and certification systems, and criteria relating to design and building techniques for residential buildings established and prescribed by this Part.

(cc) “Ground source heat pump” means a space conditioning system that employs a geothermal resource - the ground, groundwater, or surface water - as both a heat source and sink, and uses a reversible refrigeration cycle to provide either heating or cooling. A ground source heat pump may be part of an open loop system, where the heat transfer fluid is extracted, used,

and returned to the environment, a closed loop system, where the heat transfer fluid is permanently contained within the system, or a direct expansion system, where only a refrigerant is circulated through the pipes and there is no separate heat transfer fluid component.

(dd) “Home Energy Rating System (HERS) Index” means a numeric comparison of relative energy resource use between a newly constructed or renovated residential building and a referenced residential building meeting only the minimum requirements of the Energy Conservation Construction Code of New York (19 NYCRR Part 1240); a “HERS Index” is expressed on a descending scale, from 150 to 0, with a score of 0 indicating that the residential building uses no net purchased energy resources.

(ee) “In-line ventilating fan” means a fan installed within the residential building containing ductwork on both intake and exhaust.

(ff) “LEED” means the Leadership in Energy and Environmental Design (LEED) Rating Systems, developed by the U. S. Green Building Council.

(gg) “Light kit” means a complete lighting unit consisting of lamp(s) and ballasting, when applicable, or LED light engine(s), together with the parts designed to distribute the light, to position and protect the lamp(s), and to connect the lamp(s) to the main(s).

(hh) “NGBS” means the National Green Buildings Standard, International Code Council (ICC) 700-2008, developed by the National Association of Home Builders.

(ii) “Open Loop Ground Source Heat Pump” means a ground heat exchanger in which the heat transfer fluid is part of a larger environment, and which may use groundwater or surface water as the heat transfer medium.

(jj) “Owner” means a person who holds title to a residential building with qualified occupied square footage on the date that: (1) a Certificate of Occupancy is issued to such building in the case of a new residential building or (2) substantial renovations to an existing residential building are completed and a Certificate of Occupancy is issued to such building in connection with such renovation.

(kk) “Peak hour demand” means the maximum potential use of hot water in one hour by occupants for purposes of bathing and performing other personal hygiene activities, washing dishes, preparing foods, and washing clothes,

(ll) “Program” means the Green Residential Building Program prescribed in this Part.

(mm) “Qualified occupied square footage” means the habitable spaces of a residential building meeting the green residential building standards; “qualified occupied square footage” shall not include any common areas, storage areas, mechanical rooms, utility rooms, attic and

crawl spaces, attached and detached garages, and other unoccupied spaces or the portion of a mixed-use building that does not constitute a dwelling unit.

(nn) “Radiant heating system” means a heating system that supplies heat directly to the floor, panels on the wall, or ceiling.

(oo) “Residential building” means a single-family building, including townhouses, manufactured homes, and modular homes, and a multi-family building with fewer than twelve dwelling units.

(pp) “Single package central air conditioner” means a central air conditioner that combines both condenser and air handling capabilities in a single casing.

(qq) “Single package heat pump” means an air-source heat pump that combines both condenser and air handling capabilities in a single casing.

(rr) “Split system central air conditioner” means a central air conditioner with separate indoor (evaporator) and outdoor (condenser) units.

(ss) “Split system heat pump” means an air-source heat pump with separate indoor (evaporator) and outdoor (condenser) units.

(tt) “Standard dishwasher” means a dishwasher that has a capacity equal to or greater than eight place settings (consisting of 1 cup and saucer, 1 dinner plate, 1 bread and butter plate, 1 dessert bowl, 1 iced tea glass, 1 knife, 1 spoon, and 2 forks) and six serving pieces (consisting of 1 serving platter, 2 serving bowls, 1 serving cold meat fork, and 2 serving spoons).

(uu) “Substantial renovations” means significant improvements, additions, or restorations to, or substantial replacement or repair of, materials, systems, or components of, a residential building and must include removal of one side of all exterior walls, and may include installation, replacement, or upgrading of insulation; air sealing measures; heating, ventilation, and air conditioning equipment; plumbing fixtures; roof assemblies; and other comparable measures.

(vv) “Tankless water heater” means: (1) a water heater that uses natural gas as an energy source, (2) initiates heating based on sensing water flow, (3) is designed to deliver water at a controlled temperature of less than 180 degrees Fahrenheit, (4) has an input greater than 50,000 Btus per hour but less than 200,000 Btus per hour, and (5) has a manufacturer’s specified storage capacity of less than two gallons.

(ww) “Technician” means an individual who meets the training and qualifications prescribed by Section 508.8.

(xx) “Thermal envelope” means the layer of materials in a building envelope that controls the transfer of heat between conditioned and unconditioned spaces.

(yy) “USGBC” means the U. S. Green Building Council.

(zz) “Ventilation fan” means a device used to move air from inside the building to the outdoors and may include a mounted fan installed in a bathroom or utility room and a kitchen range hood.

### Section 508.3 Eligibility

An Owner is eligible for a Program incentive, if:

(a) a complete Application for a request for a Program incentive has been received by the Authority with respect to a residential building with qualified occupied square footage, in accordance with the procedure prescribed by Section 508.9 of this Part; and

(b) the residential building:

(1) is a new residential building that:

(A) has completed construction for purposes of receiving, and

(B) has received, a Certificate of Occupancy on or after January first, two thousand ten, but before October thirty-first, two thousand thirteen; or

(2) is an existing residential building that:

(A) has completed substantial renovation; and

(B) has received a Certificate of Occupancy on or after January first, two thousand ten, but before October thirty-first, two thousand thirteen.

### Section 508.4 Green Residential Building Standards

For purposes of the Program, green residential building standards shall mean the use of design and building techniques sufficient:

(a)(1) to obtain points necessary to receive a LEED certification using the LEED for Homes Rating System or using the LEED for New Construction Rating System; or

(2) to obtain the points necessary to receive a second or higher performance level certification using the NGBS; and

(b) to achieve at least 500 kilowatt hour (kWh) annual electrical savings per dwelling unit by installing equipment, lighting and household appliances meeting the following minimum

efficiency standards and which exceed applicable minimum efficiency standards prescribed in 10 Code of Federal Regulations (CFR) Part 430, based upon inclusion of one or more of the following:

(1) installed CFLs and other lighting fixtures and lamps in high usage areas, including primary living spaces, finished basements, walk-in closets, and outdoor areas, but excluding non-walk-in closets and unfinished basements, and has installed only CFLs and lighting fixtures that meet the minimum efficacy levels set forth in Table 1, Parts A, B, and C determined in accordance with the test procedures set forth in Table 1; such CFLs and lighting fixtures shall be credited with the following kWh savings: screw-based CFL, 35 kWh each; pin-based or fixture-based CFL, 50kWh each; and

| <b>Table 1: Lamps and Lamp/Ballast Fixtures: Efficacy Requirements</b>              |   |   |   |
|---|---|---|---|
| <b>Part A: Bare, Covered, Globe, and Outdoor Reflector CFL Testing Requirements</b> |   |   |   |
| <b>Criteria</b>   | <b>Requirements</b>   |   | <b>Test Procedure for determining efficacy</b>              |
| Lamp Power (Watts) and Configuration  | Minimum Efficacy: Lumens/watt (Based on initial lumen data) |   | IESNA <sup>a</sup> – LM66-00 for lumen output and efficacy. |
|   | Efficacy requirements (Medium screw-base)                   | Efficacy requirements (Candelabra screw-base) |   |
| Bare Lamp (Fixed Light Output):   |   |   |   |
| Lamp Power < 10   | 50  | 50  |   |
| 10 < Lamp Power < 15  | 55  | 55  |   |
| 15 ≤ Lamp Power   | 65  | NA  |   |
| Bare Lamp (Dimmable/2-way/3-way):   |   |   |   |
| Lamp Power < 15   | 50  | 50  |   |
| Lamp Power ≥ 15   | 60  | NA  |   |
| Covered Lamp (no reflector):  |   |   |   |
| Lamp Power < 7  | 40  | 35  |   |
| 7 < Lamp Power < 15   | 45  | 45  |   |
| 15 < Lamp Power < 25  | 50  | NA  |   |
| Lamp Power > 25   | 60  | NA  |   |
| Outdoor Reflectors:   |   |   |   |
| Lamp Power < 20   | 33  | NA  |   |
| Lamp Power > 20   | 40  | NA  |   |

| <b>Part B: Reflector CFLs for Recessed Downlights/Indoor Use Testing Requirements</b> |   |   |
|---|---|---|
| <b>Criteria Item and Submission</b>   | <b>Requirement</b>  | <b>Test Procedure for Determining Efficacy</b>              |
| Lamp Power (Watts) and Configuration Reflectors:                                      | Minimum Efficacy: Lumens/watt (Based on initial lumen data) | IESNA <sup>a</sup> – LM66-00 for lumen output and efficacy. |
| Lamp Power < 20   | 33  |   |
| Lamp Power > 20   | 40  |   |

| <b>Part C: Combined Lamp and Ballast Efficacy Requirements</b>     |  |  |
|--|--|--|
| <b>Performance Characteristics</b>                                 | <b>Requirements</b>  | <b>Test Procedure for determining efficacy</b>             |
| System Efficacy Per Lamp Ballast Platform in Lumens Per Watt (LPW) | $\geq 50$ LPW for all lamp types below 30 total listed lamp watts.<br>$\geq 60$ LPW for all lamp types that are < 24 inches and > 30 total listed lamp watts.<br>$\geq 70$ LPW for all lamp types that are > 24 inches and > 30 total listed lamp watts. | IESNA <sup>a</sup> LM-9 and LM-66; ANSI <sup>b</sup> C82.2 |

<sup>a</sup> IESNA means the Illuminating Engineering Society (of North America)

<sup>b</sup> ANSI means the American National Standards Institute

(2) *Dishwasher*: if a dishwasher has been installed, has installed only a standard dishwasher(s) and compact dishwasher(s) that meet the minimum energy efficiency requirements set forth in Table 2, determined in accordance with the test procedures set forth in 10 Code of Federal Regulations (CFR) 430, Subpart B, Appendix C; such dishwasher shall be credited with 50 kWh each; and

| <b>Table 2: Minimum Energy Efficiency Requirements for Dishwashers</b> |                                       |                                    |  |
|--|---------------------------------------|------------------------------------|--|
| <b>Dishwasher Type</b>   | <b>Standard as of August 11, 2009</b> | <b>Standard as of July 1, 2011</b> | <b>Test Procedure for Determining Efficiency Level</b> |

|          |   |  |                                       |
|----------|---|--|---------------------------------------|
| Standard | $\leq 324$ kWh/year<br>$\leq 5.8$ gallons/cycle | $\leq 307$ kWh/year<br>$\leq 5$ gallons/cycle      | 10 CFR 430, Subpart B,<br>Appendix C. |
| Compact  | $\leq 234$ kWh/year<br>$\leq 4.0$ gallons/cycle | $\leq 222$ kWh/year<br>$\leq 3.5$<br>gallons/cycle | 10 CFR 430, Subpart B,<br>Appendix C. |

(3) *Refrigerators, refrigerator/freezers, and freezers:* has installed only refrigerators, refrigerator-freezers, and freezers that meet the minimum energy efficiency levels set forth in Table 3 determined in accordance with the following test procedures: a refrigerator and the refrigerator portion of a refrigerator/freezer shall have been self-tested by its manufacturer in accordance with the U.S. Department of Energy’s test procedure set forth in 10 Code of Federal Regulations (CFR) 430, Subpart B, Appendix A1; a freezer and the freezer portion of a refrigerator/freezer shall have been self-tested by its manufacturer in accordance with the test procedure set forth in 10 Code of Federal Regulation (CFR) 430, Subpart B, Appendix B1; such refrigerator and refrigerator/freezer shall be credited with 100 kWh each, and such freezer shall be credited with 50 kWh each; and

| <b>Table 3: Minimum Efficiency Requirements for Refrigerators, Refrigerator-Freezers, and Freezers</b> |                                  |
|--|----------------------------------|
| <b>Product Class</b>   | <b>Energy Use (kWh per year)</b> |
| Refrigerator & refrigerator-freezer with manual defrost  | $\leq 7.056*AV_a + 198.72$       |
| Refrigerator-freezer with partial automatic defrost  | $\leq 7.056*AV + 198.72$         |
| Top mount freezer without through-the-door ice   | $\leq 7.84*AV + 220.8$           |
| Side mount freezer without through-the-door ice  | $\leq 3.928*AV + 406$            |
| Bottom mount freezer without through-the-door ice  | $\leq 3.68*AV + 367.2$           |
| Top mount freezer with through-the-door ice  | $\leq 8.16*AV + 284.8$           |
| Side mount freezer with through-the-door ice   | $\leq 8.08*AV + 324.8$           |
| Upright freezer with manual defrost  | $\leq 6.795*AV + 232.47$         |
| Upright freezer with automatic defrost   | $\leq 11.187*AV + 293.49$        |
| Chest freezers   | $\leq 8.892*AV + 129.33$         |
| Compact refrigerator and refrigerator-freezer with manual defrost                                      | $\leq 8.56*AV + 239.2$           |
| Compact refrigerator and refrigerator-freezer with partial automatic defrost                           | $\leq 5.6*AV + 318.4$            |
| Compact refrigerator-freezer-automatic defrost with top freezer  | $\leq 10.16*AV + 284$            |
| Compact refrigerator-side mounted freezer with automatic defrost                                       | $\leq 6.08*AV + 400.8$           |

|  |                          |
|--|--------------------------|
| Compact refrigerator-bottom mount freezer with automatic defrost | $\leq 10.48*AV + 293.6$  |
| Compact upright freezers with manual defrost                     | $\leq 7.824*AV + 200.64$ |
| Compact upright freezers with automatic defrost                  | $\leq 9.12*AV + 312.8$   |
| Compact chest freezer  | $\leq 8.36*AV + 121.6$   |

<sup>a</sup> AV (“Adjusted Volume”) means, for a combination refrigerator-freezer, the volume of the fresh food compartment in cubic feet added to the product of 1.63 multiplied by the freezer volume and, and for a stand-alone freezer, the product of 1.73 multiplied by the freezer volume in cubic feet.

(4) installed furnace(s) and heat pumps, and central air conditioners, as applicable, with a high efficiency variable speed motor(s) or ECM(s), such furnace, heat pump, or air handling unit equipped with a high efficiency ECM (s) shall be credited with 400 kWh each and, if applicable, a central air conditioner(s) with a 15 SEER (as defined in Table 5) or higher, shall be credited with 175 kWh each.

#### Section 508.5 Additional Requirements for Residential Buildings of Not More Than Three Stories, Containing Four or Fewer Dwelling Units: Energy Efficiency Specifications and Performance Specifications

(a) A residential building of not more than three stories in height above grade, containing four or fewer dwelling units, shall have met or exceeded the following energy efficiency specifications:

(1) achieved either an Expanded HERS Score of 84 or higher or a HERS Index of 80 or lower, using a rating software tool that has been approved by the Authority and that generates a rating report containing the following information:

- (A) the Expanded HERS Score or HERS Index;
- (B) the estimated quantity of energy to be used annually for purposes of space heating, space cooling, water heating, lighting, using household appliances, and any other uses of energy, and an estimate of the annual energy cost for each purpose and for the residential building as a whole;
- (C) the street address or recorded real property identifier;
- (D) the name of the rater;
- (E) the date that the rating report was prepared; and
- (F) the rating software program and version number used to calculate the rating; and

(2) *Ceiling fan and light kit:* if a ceiling fan(s) has been installed, has installed only a ceiling fan(s) that meets the minimum energy efficiency levels set forth in Table 4, and only a light kit(s) that meets the minimum efficiency requirements set forth in Table 1 tested by the manufacturer in accordance with the test procedures set forth in the ENERGY STAR® Testing Facility Guidance Manual: Building a Testing Facility and Performing the Solid State Test Method for ENERGY STAR Qualified Ceiling Fans, Version 1.0, Draft 1, June 20, 2002; and

| <b>Fan Speed</b> | <b>Minimum Airflow</b>      | <b>Efficiency Requirement</b>  |
|------------------|-----------------------------|--------------------------------|
| Low              | 1,250 cubic feet per minute | 155 cubic feet per minute/watt |
| Medium           | 3,000 cubic feet per minute | 100 cubic feet per minute/watt |
| High             | 5,000 cubic feet per minute | 75 cubic feet per minute/watt  |

(3) *Central air conditioner:* if a central air conditioner has been installed:

(A) has installed in residential buildings located in Bronx, Kings, New York, Queens, Richmond, and Westchester Counties, if applicable, only a central air conditioner(s) that has a 14.5 SEER (as defined in Table 5) and a 12 EER (as defined in Table 5), or higher, for split systems, and that has a 14.5 SEER (as defined in Table 5) and 11 EER (as defined in Table 5), or higher, for single package systems; a central air conditioner(s) shall meet the energy efficiency requirements set forth in Table 2 determined in accordance with the test procedures set forth in Table 2; and

(B) has installed in residential buildings located in all other New York state counties, except those listed in subparagraph (A) above, only a central air conditioner(s) that meets the minimum energy efficiency requirement set forth in Table 5 determined in accordance with the test procedures set forth in Table 5; and

(C) after installation, has operated the cooling cycle to confirm that any new ducted distribution system is installed to meet +/- 15 percent of room airflow for Btu loads for each room being conditioned, calculated in accordance with ACCA Manual D; and

| <b>Type</b>                                     | <b>Minimum Efficiency</b>                    | <b>Test Procedure for Determining Efficiency Level</b> |
|---|--|--|
| Central Air Conditioner (split system)          | 14.5 SEER <sup>a</sup> / 12 EER <sup>b</sup> | ARI <sup>c</sup> 210/240                               |
| Central Air Conditioner (single package system) | 14 SEER/11 EER                               | ARI 210/240  |

<sup>a</sup> SEER (“Seasonal Energy Efficiency Ratio”) means the total cooling output of a central air conditioner in Btus

during its normal annual usage period for cooling divided by the total electric energy input in watt-hours during the same period

<sup>b</sup> *EER* (“Energy Efficiency Ratio”) means the ratio of net cooling capacity in Btus per hour to the total rate of electric input in watts, under designated operating conditions

<sup>c</sup> *ARI* means the Air-Conditioning & Refrigeration Institute

(5) *Domestic water heater*: (A) has installed only a domestic water heater(s) that has a first-hour rating that meets the capacity for the calculated peak hour demand within one to two gallons; and

(B) if an oil-fired domestic water heater has been installed, has installed only an oil-fired domestic water heater(s) that has a flame retention burner; and

(C) if a domestic water heater using natural gas or propane has been installed, has installed only a domestic water heater(s) using natural gas or propane that meets the minimum energy efficiency requirements set forth in Table 6 determined in accordance with the test procedures set forth in 10 Code of Federal Regulations (CFR) 430; and

(D) if a natural gas tankless water heater has been installed, has installed only a natural gas tankless water heater that meets the minimum energy efficiency requirements set forth in Table 6 determined in accordance with 10 Code of Federal Regulations (CFR) 430; and

| <b>Rated Storage Capacity<br/>(in gallons)</b> | <b>Minimum EF for Natural<br/>Gas or Propane Water<br/>Heaters</b> | <b>Minimum EF for Electric<br/>Water Heaters</b> |
|--|--|--|
| 30   | 0.63   | 0.94   |
| 40   | 0.61   | 0.93   |
| 50   | 0.59   | 0.92   |
| 75   | 0.54   | 0.90   |
| 100  | 0.49   | 0.87   |
| Natural Gas Tankless<br>Water Heaters          | 0.82   |  |

(6) *Heating equipment - heat pumps and furnaces*: (A) has installed a heating system(s) that meets or exceeds the minimum efficiency requirements set forth in Table 7 determined in accordance with the test procedures set forth in Table 7; and

(B) if a heat pump is installed, has operated the heating and cooling cycle to confirm that any new ducted distribution system is installed to meet +/- 15 percent of room airflow for

Btu loads for each room being heated, calculated in accordance with ACCA Manual D; and

| <b>Table 7: Minimum Efficiency Levels for Primary Residential Heating Systems</b> |  |  |
|---|--|--|
| <b>Type</b>   | <b>Minimum Efficiency</b>  | <b>Test Procedure for Determining Efficiency Level</b> |
| Furnace--Natural Gas  | AFUE <sup>a</sup> 92%  | 10 CFR 430, Appendix N                                 |
| Furnace-- Fuel Oil  | AFUE 85%   | 10 CFR 430, Appendix N                                 |
| Boiler--Hot Water or Steam  | AFUE 85%   | 10 CFR 430   |
| Air-Source Heat Pump--Split System  | 14.5 SEER <sup>b</sup> /12 EER <sup>c</sup> /8.2 HSPF <sup>d</sup> | ARI <sup>e</sup> 210/240                               |
| Air-Source Heat Pump--Single Package  | 14 SEER/ 11 EER/8.0 HSPF   | ARI 210/240  |
| Ground Source Heat Pump-- Closed Loop   | 14.1 EER/ 3.3 COP <sup>f</sup>                                     | ISO <sup>g</sup> 13256-1                               |
| Ground Source Heat Pump--Open Loop  | 16.2 EER/ 3.6 COP  | ISO 13256-1  |
| Ground Source Heat Pump--Direct Expansion   | 15 EER/ 3.5 COP  | ARI 870  |
| Combination Water/Space Heater  | 0.73 CAE <sup>h</sup>  | ANSI <sup>i</sup> /ASHRAE <sup>j</sup> 124-1991        |

<sup>a</sup> *AFUE* (“Annual Fuel Utilization Efficiency”) means, the ratio of annual output energy to annual input energy which includes any non-heating season pilot input loss, and for gas or oil-fired furnaces or boilers , does not include electrical energy.

<sup>b</sup> *SEER* (“Seasonal Energy Efficiency Ratio”) means the total cooling output of a central air conditioner in Btus during its normal annual usage period for cooling divided by the total electric energy input in watt-hours during the same period

<sup>c</sup> *EER* (“Energy Efficiency Ratio”) means the ratio of net cooling capacity in Btus per hour to the total rate of electric input in watts, under designated operating conditions

<sup>d</sup> *HSPF* (“Heating Seasonal Performance Factor”) means the total heating output of a heat pump during its normal annual usage period for heating divided by the total electric energy input during the same period

<sup>e</sup> *ARI* means the Air-Conditioning & Refrigeration Institute

<sup>f</sup> *COP* (“Coefficient of Performance”) means a unitless ratio of the rate of heat removal or heat delivery to the rate of energy input, in consistent units, for a complete refrigerating or heat pump system under designated operating conditions

<sup>g</sup> *ISO* means the International Standards Organization

<sup>h</sup> *CAE*(“ Combined Annual Efficiency”) means the overall efficiency of a heating system in providing both space heating and water heating in KBtu/h

<sup>i</sup> *ANSI* means the American National Standards Institute

<sup>j</sup> *ASHRAE* means the American Society of Heating, Refrigerating, and Air-Conditioning Engineers

(8) *Ventilation fans*: (A) has installed only ventilation fans that meet the minimum energy efficiency levels set forth in Table 8 determined in accordance with the test procedures set forth in Table 8; and

(B) has installed only combination ventilation fan(s) that meets the efficiency specifications set forth in Table 8 and the light source criteria set forth in Table 9; and

| <b>Table 8: Minimum Efficiency Requirements for Ventilation Fans Using Home Ventilating Institute Standards 915, 916, and 920 Test Criteria for Ventilation Fans</b> |                                       |                                |
|--|---------------------------------------|--------------------------------|
| <b>Product</b>   | <b>Airflow</b>                        | <b>Efficiency Requirement</b>  |
| Range Hoods  | Up to 500 cubic feet per minute (max) | 2.8 cubic feet per minute/watt |
| Bathroom & Utility Room Fans   | 10 -80 cubic feet per minute          | 1.4 cubic feet per minute/watt |
| Bathroom & Utility Room Fans   | 90 -130 cubic feet per minute         | 2.8 cubic feet per minute/watt |
| Bathroom & Utility Room Fans   | 140 -500 cubic feet per minute (max)  | 2.8 cubic feet per minute/watt |
| In-Line Ventilating Fans   |                                       | 2.8 cubic feet per minute/watt |

| <b>Table 9: Light Source Criteria for Combination Ventilation Fans</b> |   |
|--|---|
| <b>Performance Characteristic</b>                                      | <b>Specification</b>  |
| System Efficiency per lamp ballast combination, Lumens per Watt (LPW)  | $\geq 46$ LPW for all lamp types below 30 total listed lamp watts<br>$\geq 60$ LPW for all lamp types that are $\leq 24$ inches and $\geq 30$ listed lamp Watts<br>$\geq 70$ LPW for all lamp types that are $\geq 24$ inches and $\geq 30$ listed lamp Watts |
| Maximum Total Lamp Wattage (excluding night lights)                    | $\leq 50$ Watts   |
| Maximum Night Light Wattage  | $\leq 4$ Watts  |

(b) A residential building of not more than three stories in height above grade, containing four or fewer dwelling units, shall have met or exceeded the following performance specifications:

(1) *Building envelope*: has installed a building envelope that has five or fewer air changes per hour measured at a pressure difference of 50 Pascals, using a blower door; and

(2) *Duct leakage:* (A) has conducted duct leakage testing using the blower door subtraction method, flow hood test, or duct blower test, and such leakage shall not exceed 6 cubic feet per minute to outdoors per 100 square feet of conditioned floor area; or

(B) has only installed ducts and a furnace or heat pump in conditioned space and has determined that building envelope leakage using a blower door test is less than or equal to 3 air changes per hour at a pressure difference of 50 Pascals; and

(3) *Mechanical ventilation:* (A) has installed only an automatically controlled mechanical ventilation system that meets the minimum ventilation requirements set forth in Table 10 determined in accordance with the test procedures set forth in Table 10; and

(B) has installed only a mechanical ventilation system that operates automatically, without occupant intervention, exhausts to the exterior of the building, and has a readily available and accessible override control.

| <b>Table 10: Minimum ventilation requirements Using ASHRAE<sup>a</sup> 62.2 Minimum Ventilation Requirement (cubic feet per minute)</b> |      |                               |          |          |          |          |          |          |
|---|------|-------------------------------|----------|----------|----------|----------|----------|----------|
| <b>Square Footage</b>   |      | <b>← Number of Bedrooms →</b> |          |          |          |          |          |          |
|   |      | <b>1</b>                      | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> |
|   | 1000 | 25                            | 33       | 40       | 48       | 55       | 63       | 70       |
| 1001  | 1500 | 30                            | 38       | 45       | 53       | 60       | 68       | 75       |
| 1501  | 2000 | 35                            | 43       | 50       | 58       | 65       | 73       | 80       |
| 2001  | 2500 | 40                            | 48       | 55       | 63       | 70       | 78       | 85       |
| 2501  | 3000 | 45                            | 53       | 60       | 68       | 75       | 83       | 90       |
| 3001  | 3500 | 50                            | 58       | 65       | 73       | 80       | 88       | 95       |
| 3501  | 4000 | 55                            | 63       | 70       | 78       | 85       | 93       | 100      |
| 4001  | 4500 | 60                            | 68       | 75       | 83       | 90       | 98       | 105      |
| 4501  | 5000 | 65                            | 73       | 80       | 88       | 95       | 103      | 110      |
| 5001  | 5500 | 70                            | 78       | 85       | 93       | 100      | 108      | 115      |
| 5501  | 6000 | 75                            | 83       | 90       | 98       | 105      | 113      | 120      |

<sup>a</sup> *ASHRAE* means the American Society of Heating, Refrigerating, and Air-Conditioning Engineers

Section 508.6 Program Incentive Award Determinations

(a) Subject to the availability of funds, Program incentives shall be paid to Owners for qualified occupied square footage, as follows:

|  |
|--|
| <b>Program Incentive by Number of Dwelling Units</b> |
|--|

| Number of Dwelling Units | Program Incentive Award/ Qualified Occupied Sq. Ft. | Maximum Program Incentive Award |
|--------------------------|---|---------------------------------|
| 1                        | \$3.75/sq. ft.                                      | \$5,125                         |
| 2                        | \$3.75/sq. ft.                                      | \$6,125                         |
| 3                        | \$3.75/sq. ft.                                      | \$7,125                         |
| 4                        | \$3.75/sq. ft.                                      | \$8,125                         |
| 5                        | \$3.75/sq. ft.                                      | \$8,875                         |
| 6                        | \$3.75/sq. ft.                                      | \$9,625                         |
| 7                        | \$3.75/sq. ft.                                      | \$10,375                        |
| 8                        | \$3.75/sq. ft.                                      | \$11,125                        |
| 9                        | \$3.75/sq. ft.                                      | \$11,875                        |
| 10                       | \$3.75/sq. ft.                                      | \$12,625                        |
| 11                       | \$3.75/sq. ft.                                      | \$13,375                        |

(b) No Owner shall receive more than one hundred twenty thousand dollars in Program incentive payments during any calendar year.

#### Section 508.7 Inspection and Compliance Procedures

(a) An Owner of a residential building being newly constructed or a residential building undergoing substantial renovation shall have such residential building inspected, and a written inspection records provided to such Owner, by a Technician, during such construction or renovation, at the following times and for the following purposes:

(1) after framing and installation of the electrical system, rough plumbing, the heating, ventilation, and air conditioning system, and insulation, but prior to installation of drywall or interior wall surfaces, the Technician shall:

- (A) determine if all minimum LEED and NGBS standards have been met;
- (B) determine if insulation is aligned properly with the air barrier;
- (C) determine if the air barrier and thermal envelope are continuous and complete; and
- (D) determine if air sealing measures are complete;
- (E) determine if insulation is installed in the building envelope and uniformly fills each cavity without substantial gaps, voids, or compressions, is enclosed on all six sides, and is in substantial contact with either the interior or exterior sheathing material; and
- (F) determine the number of LEED or NGBS points attributable to the following systems: foundation and framing materials; windows; doors; heating, ventilating, and air

conditioning system; plumbing system; and site preparation construction techniques used, including clearing, grading, soils management, and erosion and sedimentation control; and

(2) after installation of all flooring, household appliances, heating, ventilation, and air conditioning equipment, plumbing, electrical wiring, the Technician shall determine the number of LEED or NGBS points attributable to installation of interior finish materials and trim, including paints and coatings; cabinets, casework, and carpets; and yearly heating, ventilation, and air conditioning and hot water heating equipment efficiency; household appliances and lighting efficiency; and plumbing fixture efficiency; and

(3) after installation of combustion boilers and furnaces, the Technician shall test combustion safety in accordance with the test procedures set forth in ANSI Standard Z223.1-2002, Annex H Recommended Procedure for Safety Inspection of an Existing Appliance Installation for boilers and furnaces covered by such standard, and record the results; and

(4) after construction of the building envelope is complete and after installation of all heating, ventilating, and if applicable, central air conditioners and associated pipes and ducts, the Technician shall confirm that the performance specifications prescribed by Section 508.5 have been met; provided, however, the same Technician shall be required to perform the inspections required by paragraphs (a)(1) and (a)(2), in the absence of extraordinary circumstances.

(b) With respect to residential buildings of not more than three stories in height above grade, containing four or fewer dwelling units, a Technician shall inspect such residential building to determine that the energy efficiency specifications and performance specifications prescribed by Section 508.5 have been met.

#### Section 508.8 Builder and Technician Training and Qualifications

(a) For purposes of performing inspections pursuant to this Part, a Technician shall meet one or more of the following qualifications or training requirements:

(1) has at least 12 hours of design or installation training by an accredited education institution or a professional builders association or affiliate, or other comparable and Authority approved training course, in one or more of the following: site planning and development for building green; heating systems, cooling systems, creating healthful indoor air quality environments; building envelopes, building materials; water use reduction techniques, green construction techniques, multi-family green construction techniques, multi-family energy analysis, building energy analysis, energy modeling and building performance testing; or

(2) has professional experience with respect to the construction or substantial renovation of a residential building meeting these green residential building standards within the last 3 years

and has participated, or agrees to participate, in at least 15 hours of training every 2 years since completion of such construction or substantial renovation; or

(3) has one year management and supervisory builder experience in green residential building construction; or

(4) has 5 years of field experience in green or sustainable residential construction, or in a combination of both.

(b) Nothing herein contained shall prohibit a builder of, Owner of, prospective buyer of, or other person holding title to, a residential building, who possesses the training or qualifications prescribed by this section, from qualifying as a Technician with respect to other residential buildings being newly constructed or undergoing substantial renovation, but shall not inspect any residential building owned by such Technician or in which such Technician has a financial interest.

#### Section 508.9 Application for Program Incentive

(a) For an Owner to receive a Program incentive for a residential building with qualified occupied square footage, such owner shall submit an Application which shall include, but is not limited to, the following information:

(1) name and address of Owner;

(2) residential building address(es);

(3) designation of the residential building as a single family residential building or a multi-family residential building;

(4) for residential buildings with more than one dwelling unit, number of dwelling units for which a Program incentive is requested and the total number of dwelling units in the residential building;

(5) qualified occupied square footage of each dwelling unit;

(6) a copy of the Certificate(s) of Occupancy;

(7) a written description of the work performed that earned the incentive, which shall include but not be limited to design and construction techniques used to obtain the points necessary to obtain the LEED or NGBS certification and the minimum energy efficient specifications and performance specifications;

(8) a copy of the written record of inspections performed in accordance with the requirements of Section 508.7 by a Technician who meets the qualifications of Section 508.8; and

(9) a copy of the residential building's (A) LEED certification based on the LEED for Homes Rating System or LEED for New Construction Rating System; or (B) second or higher level NGBS certification; and

(b) upon receipt of an Application, if the Authority determines that the Application is incomplete. The Authority shall notify the Owner within 45 days of receipt of the Application and describe the information that is needed to complete the Application.

#### 508.10 Exceptions

Exceptions to specific requirements contained in this Part may be made by the Authority on a limited and case-by-case basis, if compliance:

(a) would be inconsistent with public health or safety;

(b) would not be in compliance with Federal, State, or local law, rule or regulation, administrative or judicial order, or other such requirement; or

(c) with respect to an historic building eligible for or listed on the State or National Register of Historic Places would be incompatible or significantly inconsistent with the historic, aesthetic, cultural, or archeological character of the building.

#### 508.11 Reporting

No later than September first, two thousand eleven and September first of each year thereafter, the President of the Authority shall prepare and furnish a written report to the Governor, the Temporary President of the Senate, and the Speaker of the Assembly concerning activities under this Part. Such report shall include, but shall not be limited to:

(a) the name and address of each recipient of an incentive award pursuant to this Part during the preceding calendar year; and

(b) the amount of any incentive award made to each such person; and

(c) a description of the project and the work performed that earned the incentive award.

#### 508.12 Referenced Material

[insert table]