

# Summary of the Massachusetts Building Code Appendix 120.AA, 'Stretch' Energy Code

Appendix 120.AA, as passed by the Massachusetts Board of Building Regulations and Standards in May 2009, is an optional appendix to the 7<sup>th</sup> edition Massachusetts Building Code 780 CMR.

This optional 'stretch' code was developed in response to the call for improved building energy efficiency in Massachusetts. Towns and cities in the Commonwealth may adopt Appendix 120.AA as an alternative to the base energy efficiency requirements of 780 CMR and the forthcoming 8<sup>th</sup> edition, which will be based on the recently published IECC (International Energy Conservation Code) 2009 energy code. The Green Communities Act of 2008 requires that Massachusetts adopt each new IECC within one year of its release.

The stretch code is applicable to new construction of both Residential and Commercial buildings, although small commercial buildings less than 5,000 sq ft are exempt. Residential renovations and additions are also covered as summarized below.

The stretch code may be adopted by any municipality in the commonwealth, by decision of its governing body. In a city having a Plan D or Plan E charter the governing body shall be the city manager and the city council, and in any other city the mayor and city council. In towns the governing body shall be the board of selectmen. In order to be adopted, the appendix must be considered at an appropriate municipal public hearing, subject to the municipality's existing public notice provisions.

**Residential** - A performance-based code requiring a Home Energy Rating System<sup>1</sup> (HERS) index score as follows (lower scores mean better efficiency):

HERS index of 65 or less for new homes above 3,000 square feet and 70 or less for new homes below 3,000 square feet (includes multi-family buildings of 3 stories or less).

HERS index of 80 or less for major renovations to homes above 2,000 square feet, or 85 or less for homes below 2,000 square feet. All renovations and additions may instead use a "prescriptive" approach, where specific efficiency measures are required rather than a HERS index number. This utilizes the Energy Star for Homes prescriptive requirements, and insulation equal to IECC 2009 for climate zone 5.

The performance-based approach requires 3<sup>rd</sup> party certification from a HERS rater to be submitted to the local building code official. A HERS index of 65 means that the home is estimated to use 65% as much energy as the same size and type of home built according to the standards of the 2006 Massachusetts energy code (which would have a HERS index of 100), or a 35% annual energy savings.

**Commercial** – A performance-based code for large buildings with the option of a prescriptive-based code for medium-sized buildings. Buildings smaller than 5,000

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<sup>1</sup> For a summary of the HERS index see: [http://www.energystar.gov/index.cfm?c=bldrs\\_lenders\\_raters.nh\\_HERS](http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_HERS)

square feet are exempt, and remain subject to the base code. Also exempt are “specialty” buildings – supermarkets, laboratories, and warehouses – below 40,000 square feet in size.

Large buildings over 100,000 square feet are required to meet a performance standard set at 20% below the energy usage of the commonly used ASHRAE 90.1 2007 code, demonstrated through modeling by methods and software approved by the BBRS.

Medium-sized commercial buildings, which include residential buildings of 4 stories or more, but that are less than 100,000 square feet, have the option of meeting the large building performance standard, or using a simplified, prescriptive energy code as an alternative to Chapter 13 in the current Energy Code 780 CMR.

The prescriptive code is based on Chapter 5 of the IECC 2009 energy code. As you read the revised Chapter 5, the text in black is language retained from the IECC 2009 code, while the improved energy efficiency requirements are marked in red and include:

- a. Building envelope elements (walls, roofs, windows, insulation, basements, etc.)
- b. Building classes distinguished by a "Group R" for Residential buildings and "All Other" (Commercial).
- c. Commissioning requirements to ensure that buildings' energy systems operate as designed.
- d. More efficient lighting power densities and improved lighting controls.
- e. Improved air leakage requirements that are already in the MA code.
- f. A set of alternative prescriptive packages that allow several compliance paths including high efficiency HVAC equipment, reduced lighting power density, grid-responsive buildings, or on-site renewable energy.

This prescriptive “beyond code” appendix was developed from the Core Performance Guide of the New Buildings Institute, a program that has been used for utility incentive programs in Massachusetts for the past couple of years. The Core Performance program used over 30,000 energy modeling runs to evaluate and rank the most cost effective modifications to the ASHRAE 90.1 code, and has been run specifically with Boston climate data to represent Massachusetts. Certain areas of this proposal were also informed by other energy code activities around the country and refined for specific application in Massachusetts where they are cost-effective. For example, reduced lighting power densities reduce both first costs and ongoing electric utility costs.

This stretch code also addresses the significant energy savings possible from utilizing the more efficient HVAC equipment currently available in the marketplace. While federal minimum efficiency standards do exist, the HVAC industry has an array of equipment offerings with efficiencies that perform significantly better than those federal minimums. These higher standards are included in an optional compliance path, allowing Massachusetts to take advantage of better equipment while avoiding federal preemption issues.