

Summary of the Proposed Massachusetts Appendix 120.AA ‘Stretch’ Energy Code¹

Appendix 120.AA is proposed by the Massachusetts Board of Building Regulations and Standards, in collaboration with the Executive Office of Energy and Environmental Affairs, as an optional amendment to the 7th edition Massachusetts Building Code 780 CMR.

This optional ‘stretch’ code has been 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 8th 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:

Residential - A performance-based code requiring a Home Energy Rating System² (HERS) index score as follows (lower scores mean better efficiency):

HERS index of 60 or less for new homes, both single-family and multi-family.

HERS index of 70 or less for major renovations, or 85 or less where existing heating systems are retained.

This performance-based approach will require 3rd party certification from a HERS rater to be submitted to the local building code official. A HERS index of 60 means that the home is estimated to use 60% 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 40% annual energy savings.

For renovations and additions of less than 600 square feet and less than 30% of the building’s conditioned floor area, or where a HERS rating is not feasible, the [prescriptive code option of the Energy Star Homes program](#) for climate zone 5A applies; with insulation greater than or equal to IECC 2009 requirements for climate zone 6A (i.e., slightly more stringent than the MA base code).

“Prescriptive” means that particular measures are required, such as air sealing characteristics and insulation levels. This is instead of a “performance based” approach, where an expected level of energy use, based on modeling, is required.

¹ Published by Massachusetts BBR. Available at: http://www.mass.gov/Eeops/docs/dps/inf/stretch_code_overview_final.doc

² For a summary of the HERS index see: http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_HERS

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 square feet are exempt, and remain subject to the base code.

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 we have confidence that 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. We included these higher standards in an optional compliance path, allowing Massachusetts to take advantage of better equipment while avoiding federal preemption issues.