

Residential Energy Code Training

To **schedule a training session** with your group email energycodesma@psdconsulting.com

All courses have been approved for **continuing education** for MA code officials and CSL licensees

Course 1: 2018 IECC Update (1 hour)

In March 2019, the BBRS approved the 2018 IECC with MA amendments, as the baseline energy code. This new energy code has an effective date of February 7th, with a concurrency period lasting until August 7th. This presentation will highlight the salient changes to the base energy code. Topics discussed will include changes to compliance path options, new requirements for prescriptive path users, and changes to ERI and Passive House documentation requirements.

Course 1: Are You Ready for Solar-Ready? And Other Energy Code Updates (3 hours)

Solar-Ready Provisions of the 9th Edition and 2018 IECC Updates (1 hour)



This module will review new code provisions in the Massachusetts 9th Edition and significant changes between the 2015 and 2018 IECC. The first portion of the program covers new solar-ready provisions including scope, solar-ready rooftop area requirements, exceptions, roof orientations, documentation, interconnection pathways and roof loads, and electrical requirements. Next the program will cover changes to duct insulation, hot water piping, duct leakage, whole-house mechanical ventilation and related MA amendments. Finally, the presenter will discuss the Energy Rating Index (ERI) compliance path and the Stretch Code.

3rd Party Residential Energy Code Verification (1 hour)



Building inspectors cannot directly verify every aspect of the code, but luckily, there are experienced energy professionals who can provide verification of the most important energy code requirements. This course covers critical documentation including reports for ERI/HERS, the Simulated Performance Alternative, mechanical ventilation airflow, duct leakage testing, and blower door testing reports, and air barrier and insulation installation checklists. The presenter will review example verification forms, interpreting essential data, and keeping track of this information with a one-page checklist.

The Energy Code and Additions, Alteration, and Repairs (1 hour)



Residential renovations, alterations, repairs, and additions make up the largest proportion of building permit applications; yet, confusion abounds as to how the energy code applies such as when duct testing is required, how should ducts be insulated, and blower door testing requirement for additions. This course will cover several of the most common types of existing home projects and describe the applicability of the most important energy code provisions.

Course 2: Efficient, Effective, and Code Compliant HVAC and DHW (3 hours)

Mechanical Systems and Service Water Heating (1 hour)



Mechanical systems and service water heating systems are key elements to energy performance of residential buildings. At the same time, code provisions related to these systems are among those with least code compliance. This course covers code provisions with the highest energy impacts and suggestions for verifying compliance during plan reviews and inspections. Topics will include mechanical system sizing, mechanical piping insulation, controls such as programmable thermostats, heat pump supplementary heat and hot water boiler outdoor temperature setback; circulation systems and demand recirculation systems for hot water, insulation around piping in different scenarios, drain water heat recovery, and heated swimming pools.

Equipment Sizing: Manuals J and S (1 hour)



According to a 2015-16 study on single-family residential homes, only 14% of homes meet the code requirement of designing mechanical equipment based on ACCA Manual S and Manual J. This course covers Manual S requirements and why following Manual S would not only lower energy bills, but also increase comfort. The discussion will include the ACCA design process, Manual J load calculation process & modeling which is the first step in sizing equipment properly, Manual S oversizing provisions, available software tools to carry out Manual S calculations, and ends with a case study demonstrating how the Manual J and Manual S process works.

Duct Sealing, Testing, and Design (1 hour)



According to a 2015-16 study on single-family residential homes, over 90% of all homes studied had all or portion of duct systems in unconditioned space which means all these homes would require duct testing and portions outside conditioned space should be insulated. This course discusses code requirements for duct testing, prescriptive duct leakage requirements, duct insulation and sealing requirements. With a discussion on best practices in duct insulation, the presenter will discuss Manual D which is a process to design duct systems and required by code.

Course 3: Ventilation for Tight Homes: Reducing Energy Waste, Improving IAQ (3 hours)

Residential Air Barrier and Insulation Installation (1.5 hours)



The installation of a continuous air and thermal barrier is perhaps the best and most cost-effective way to reduce energy waste and save money on utility bills; at the same time, important details are often missed. This course will be framed around the 2018 IECC Air Barrier and Insulation Installation criteria found in Table 402.4.1.1 with photos and graphics to illustrate noncompliant and compliant installation of critical details like attic penetrations, wall-to-ceiling transitions, rim joists, garage walls, knee walls, and tubs and showers on exterior walls. Installing and inspecting insulation to meet code and manufacturer requirements will also be discussed.

Whole-House Mechanical Ventilation: Options for Code Compliance (1.5 hours)



Mechanical ventilation is as important to indoor air quality as it is for energy conservation. The second part of the course will cover 2018 IECC, IRC, and Massachusetts amendments relating to whole-house mechanical ventilation system requirements. This will include when whole-house ventilation is required, how to calculate the minimum design airflow rate, and how to verify installed airflow rates. The presenter will also provide an overview of different ventilation systems – exhaust only, supply-only and balanced ventilation (including ERVs/HRVs) – along with pros and cons of each type of system.

Course 4: Understanding the 9th Edition Stretch Code (3 hours)

Stretch Code Overview and Compliance Options (1 hour)



This course discusses energy code provisions specific to the Massachusetts stretch code, including the three available compliance paths – RESNET HERS, Passive House and ENERGY STAR. The presenter will also discuss how renewable energy tradeoffs for technologies such as solar PV, solar thermal systems, clean biomass stoves, or renewable primary heating systems. Available software programs and required documentation for each of these compliance paths will be examined.

Understanding and Reviewing 3rd Party Documentation (1 hour)



The second part of the course deals with documentation. Building inspectors cannot directly verify every aspect of the code, but luckily, there are experienced energy professionals who can provide verification and documentation of the most important energy code requirements. Clear and consistent documentation improves energy code compliance and saves time. This course covers critical documentation including ERI/HERS, ENERGY STAR v 3.1 reports, as well as PHIUS/Passive House. The presenter will review example reports and describe how to interpret essential data, along with keeping track of this information with a one-page checklist created by the Mass Save Energy Code Technical Support Program.

The Stretch Code and Existing Buildings (1 hour)



Two-thirds of all towns in Massachusetts are Stretch Code towns and residential renovations, alterations, repairs, and additions make up the largest proportion of building permit applications. Despite this, confusion abounds as to how the Stretch Code applies to existing buildings, such as when duct testing is required,

how should ducts be insulated, and blower door testing requirements. This course will cover several of the most common types of existing home projects and describe the applicability of the most important energy code provisions.