



MA Energy Code Update and The Top 10 Things You Really Need To Know... 2015 IECC and 9th Edition: Commercial

May 9, 2018

Massachusetts Codes and Standards
Compliance Support Program



What Is Mass Save®?



- Mass Save® is an initiative sponsored by Massachusetts' gas and electric utilities and energy efficiency service providers, including
 - The Berkshire Gas Company
 - Cape Light Compact
 - Columbia Gas of Massachusetts
 - Eversource Energy
 - Liberty Utilities
 - National Grid
 - Unitil
- The Sponsors of Mass Save work closely with the Massachusetts Department of Energy Resources to provide a wide range of services, incentives, trainings, and information promoting energy efficiency that help residents and businesses manage energy use and related costs.



Continuing Education



- Approved for Massachusetts Building Officials

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Presented by:

ART PAKATAR

Leidos Trainer, Designer



Today...



- **Major Changes between the 8th and 9th Edition – Commercial Provisions**
- **2015 IECC: Key Requirements + “Hot Topics”!**

But First... Documentation!



- **Complete Drawings with Full Energy Code compliance details and specifications**
- One Sheet?
 - Attic, Walls, Foundation Insulation
 - Window U-Value & Infiltration Specs
 - Air & Vapor Retarder Specs/Details
 - HVAC, SHW, Duct Insulation and Sealing Specs
 - Mechanical System Design Criteria inc. SIZING
 - HVAC Controls Specs
 - Mechanical Ventilation System Specs
 - Duct Sealing & Heating and Piping Insulation Specs
 - Elec Power & Lighting System Specs
- Commissioning Plan
- Construction/Specification Manual
- Compliance Path Documentation



Documentation...cont'd



- **Energy Code Compliance Path Documentation:**
 - **COMcheck REQUIRED for ALL PERMIT submittals!**
 - **Helps Assure Mandatory Requirements**
 - **Print out Checklists, Certificates**
 - **ASHRAE Compliance Path:** The requirements of ASHRAE 90.1-2013
 - **Prescriptive Compliance Path:** The requirements of Sections C402 through C405
 - **Performance Compliance Path:** The requirements of Sections C402.5, C403.2, C404, C405.2, C405.3, C405.5, C405.6, and C407

#1 - Effective Dates



- **DPL Adopts 9th Edition – October 9, 2017** **NEW!**
- **Effective Date October 20, 2017**
- **Interim Period – October 20 through January 1, 2018**
 - May Comply with Either 8th or 9th Edition Codes
- ***January 1, 2018 – 9th Edition in Full Force***
 - ***ALL Enhancements Effective***

#2 – COMcheck Required



NEW!

- **107.2.6 COMcheck Submittal Required**
- ALL Permits Shall Include Completed COMcheck
 - Envelope, Lighting and Mechanical Compliance Certificates
 - Plan Review Inspection Checklist for:
 - Compliance with the Energy Provisions of 780 CMR 13.00: Energy Efficiency
 - Advantage: Documentation for Code Compliance, Inspection
 - Lack of documentation ALWAYS biggest challenge for code enforcement

#3 – Solar Ready

C402.3



NEW!

- **New Low-rise Commercial Buildings and Additions**
 - 4 Stories or Less Above Grade
 - Not < 2400 ft² roof area
 - Either flat or oriented between 110 degrees and 270 degrees of true north
 - Must Comply with Solar-ready Zone Requirements
 - Interconnection pathway
 - Construction documents specification
 - Obstruction-free
 - Roof load documentation
 - Electrical service reserved space
- **Some exceptions**

#4 - Air Barriers and Construction

C402.5.1 and C402.5.1.1



- Continuous air barrier for all assemblies
- Across joints
- Joints & seams to be sealed
- Penetrations & joints sealed and compatible with material and location
- Recessed-lighting: compliant fixtures
- Placement: inside, outside, or within assemblies composing envelope
- **ABAA Program, or Auditor – Third Party?**

#4 Cont'd- Air Barrier - Examples

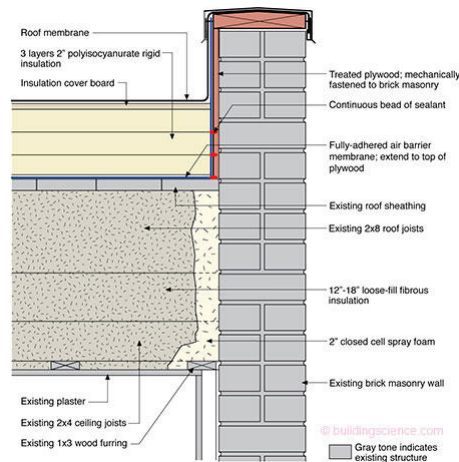


Liquid-applied



#4 Cont'd- Air Barrier – Examples

Spray Foam – High Density



#4 Cont'd - Air Barrier Testing Alternative

C402.5

- Thermal envelope must comply with:
 - Materials OR
 - Assembly provision OR
 - Tested in Accordance with ASTM E779 @0.3 in. water gauge



Building thermal envelope with a tested air leakage rate of ≤ 0.40 cfm/ft² complies with air leakage requirements

#5 - Economizer Fault Detection and Diagnostics

C403.2.4.7



Air-cooled unitary direct-expansion units and VRF units equipped with an economizer must include a fault detection and diagnostics (FDD) system:

- Outside air, supply air and return air temperature sensors must be permanently installed
- Temperature sensors must have an accuracy of $\pm 2^\circ$ F over the range of 40° to 80°F
- Refrigerant pressure sensors, where used, must have an accuracy of $\pm 3\%$ of full scale
- Unit controller must be capable of providing system status, manually initiating each operating mode and reporting faults to a fault management application
- FDD (Economizer Fault Detection and Diagnostics) system must be capable of detecting air temperature sensor fault, economizer faults, damper not modulating and excess outdoor air
- **WHY? ASHRAE Determined that 75% Economizers Nationally are Not Working !**

#6 - Mechanical Systems Commissioning and Completion

C403.2.11 Mandatory



• HVAC Commissioning

- Applies to
 - $\geq 480,000$ BTU/hr. cooling OR
 - $\geq 600,000$ BTU/hr. heating
- Requires
 - Commissioning plan
 - Systems adjusting/balancing
 - Functional testing: equipment, controls, economizers
 - Preliminary commissioning report
 - Construction documents & O&M manuals
 - Final commissioning report and air balance report

acg
ASHRAE
Commissioning
Group

Documentation

- Commissioning Team
- Basis of Design
- Design Intent
- Overview of Cx Procedures
- Pre-Functional Checklists
- Functional Performance Testing Scenarios
- Issues and Resolutions Logs

Building Performance Together

#7 – Lighting and Controls Commissioning

C408.3 Mandatory



- Applies to buildings with automatic lighting systems
 - Functional testing
- Requires:
 - Commissioning plan
 - Occupant sensors
 - Time switch controls
 - Daylight responsive controls
 - Documentation
 - Final commissioning report and certification

acg
Advanced Commissioning Group

Documentation

- Commissioning Team
- Basis of Design
- Design Intent
- Overview of Cx Procedures
- Pre-Functional Checklists
- Functional Performance Testing Scenarios
- Issues and Resolutions Logs

Building Performance Together

#8 – Setback Controls - Hot Water Boilers

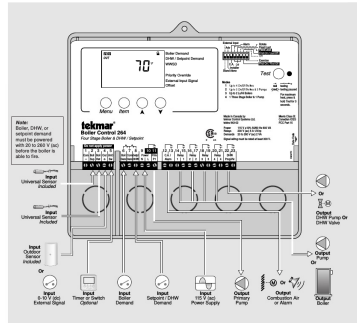


- Hot water boilers **MUST** have setback controls
- Provide setback to accommodate outside conditions

tekmar - Data Brochure D 264
12/08

The tekmar Boiler Control 264 can control the supply water temperature from up to 4 on/off stages based on outdoor temperature, control for Domestic Hot Water (DHW) generation, or a setpoint requirement. A large ease-to-read display provides current system temperatures and operating status. The control has outputs for a primary pump and either a combination air damper or alarm. Based on the mode of operation selected, the control can operate different combinations of boiler stages and boiler pumps.

- Additional functions include:
- Installer and Advanced access levels
 - Primary pump output
 - Individual boiler pump outputs (in applicable modes)
 - Pump sequencing
 - Pump staging (primary and boiler)
 - 0 - 10 V (0V) input signal
 - Boiler demand for space heating loads
 - DHW demand for DHW loads
 - Setpoint demand for setpoint loads
 - Test sequence to ensure proper component operation
 - CSA C-UL certified
 - Setback input for energy savings



#9 - Additional Efficiency Requirements

TWO additional efficiency features to comply with the IECC

More efficient HVAC
 Reduced lighting power density
 Enhanced lighting controls
 On-site renewable energy
 Dedicated outdoor air system
 High-efficiency SWH



High Efficiency HVAC



Onsite Renewables

Additional Efficiency Requirements - HVAC

- HVAC
 - Efficiencies based on Consortium for Energy Efficiency (CEE)
 - Option not available to all HVAC system types
 - Ruled “legal” by AHRI



High Efficiency HVAC

Remember - Existing Buildings Covered!

- Substantial renovations impacting systems
- Additions
- Alterations
- Repairs
- *Make Sure Your Renovation Work COMPLIES!*

QUESTIONS?



Upcoming Trainings



April 25th, 1:00 to 3:05 PM (Webinar)

Third-party Residential Energy Code Verification
What Makes a Commercial Air Barrier? It's the Details!

May 30th, 1:00 to 3:05 PM (Webinar)

Applying the Energy Code to Existing Homes
COMcheck Case Study – Simple Commercial Building

June 27th, 1:00 to 3:05 PM (Webinar)

Residential Air Barriers
COMcheck for Existing Buildings

*Give Us Your Feedback -
What Do YOU Need?*

May 9th & 10th , SEMBOA (Classroom Training)

Register at www.masssave.com/energycode

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Energy Code Support



Questions about the energy code?

Energy Code Support Hotline:

855-757-9717

Energy Code Support Email:

energycodesma@psdconsulting.com

New Buildings and Major Renovations – Commercial



- Incentives for efficiency levels beyond code and/or standard industry baselines:
 - Whole building incentives
 - System incentives including
 - Air Compressors
 - Chillers
 - Lighting and Lighting Controls
 - Gas-Fired Heating Equipment
 - Variable Speed Drives
 - Custom Measures
 - And more

We also offer incentives and rebates for existing buildings. Please visit www.MassSave.com for the details



Thanks!

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Leidos Trainer, Designer

Massachusetts Energy Code
Technical Support Program

