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## **Commercial Energy Code Building Envelope, Mechanical, Service Water Heating and Lighting**

### **PART I – GUIDELINES FOR PLAN SUBMITTAL; APPLICABILITY OF THE COMMERCIAL 2015 IECC:**

The 2015 IECC Commercial Section is applicable to any *new commercial building with conditioned space and to any residential building four stories and above grade*. A ResCheck compliance form shall be submitted for occupancies covered under the Residential Section of the IECC.

Where a building has mixed use of residential and commercial, the appropriate section of the IECC shall apply with appropriate submittal documents; Residential and Commercial submittals are required as appropriate for the portion of the mixed use building.

For additions to, remodel/alterations to, repairs of, and change of occupancy or change in use of an existing commercial building, Chapter 5 CE (*Existing Buildings*) of the 2015 IECC applies and lists specific requirements and exemptions. Generally a ComCheck is not required unless a building is being “guttled” – brought down to the structural framing and being totally renovated.

### **PART II – INFORMATION ON CONSTRUCTION DOCUMENTS:**

Construction documents shall be drawn to scale. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as governed by the IECC. Details shall include, but are not limited to, the following as applicable:

1. Insulation materials and their R-values.
2. Fenestration U-factors and solar heat gain coefficients (SHGCs).
3. Area-weighted U-factor and solar heat gain coefficient (SHGC) calculations.
4. Mechanical system design criteria.
5. Mechanical and service water heating system and equipment types, sizes and efficiencies.
6. Economizer description.
7. Equipment and system controls.
8. Fan motor horsepower (hp) and controls.
9. Duct sealing, duct and pipe insulation and location.
10. Lighting fixture schedule with wattage and control narrative.
11. Location of daylight zones on floor plans.
12. Air sealing details and narrative explaining how air barrier compliance will be met.

**Building thermal envelope depiction.** The building’s thermal envelope shall be represented on the construction drawings.

**PART III – ENERGY FORMS/REPORTS TO SUBMIT:**

**A Building Permit Application Package shall include:**

**REQUIRED** – The energy compliance documentation provided to DPS at the time of plan submittal shall, at a minimum, **include on your code analysis sheet(s)** the Method of Energy Compliance being used.

1. 2015 IECC or ASHRAE 90.1-2013?
2. If 2015 IECC is chosen, which sub-compliance method will be used?
3. Prescriptive Path (C402 through C406), or Total Building Performance Path (C407)?
4. Will the Air Barrier Details be provided, or will there be a building pressure test?
5. If 2013 ASHRAE 90.1 is chosen, which sub-method will be used?
6. Prescriptive Path (See 5.2.1), or Energy Cost Budget Method (Section 11)?
7. For the IECC Prescriptive Path, indicate which *Additional Efficiency Package* is chosen and provided in design documents.

**A commissioning plan shall be developed by a registered design professional and shall include the following:** Mechanical, service water heating systems (SWH), and electrical systems. This includes requirements for air balancing, list of mechanical electrical and plumbing systems to be included in commissioning and functional testing of controls (mechanical, electrical and plumbing) to be included.

1. A narrative description of the activities that will be accomplished during each phase of *commissioning*, including the personnel intended to accomplish each of the activities.
2. A listing of the specific equipment, appliances or systems to be tested and a description of the tests to be performed.
3. Functions to be tested including, but not limited to, calibrations and economizer controls.
4. Conditions under which the test will be performed. Testing shall affirm winter and summer design conditions and full outside air conditions.
5. Measurable criteria for performance.

Two copies of the commissioning plan shall be provided with the construction drawings. If submitting electronically, one copy shall be with the *drawings folder* and one copy shall be placed in the *documents folder*.

**REQUIRED** - Provide an **energy analysis for the building design** (software printout showing energy compliance) based on the chosen compliance strategy.

*The design itself must utilize the specific energy values indicated by the energy analysis. Mandatory sections of the 2015 IECC or ASHRAE 90.1-2013 must be complied with even if the energy analysis software printout passes without the design in compliance with a mandatory section.* There are energy compliance software options, but the submittal package must include an energy analysis printout. The software used must be a DOE approved software from one of the following options:

1. **ComCheck** published by the US Department of Energy (DOE) based on the 2013 ASHRAE Standard 90.1 (ComCheck Windows Version 4.0.0 - Build 4.0.0.3 - Downloadable – not available as the Web version) for the prescriptive path.
2. **ComCheck** based on the 2015 IECC (Scheduled for publication at the end of September 2015) for the prescriptive path; inspection checklists shall be provided with the printout.
3. **Other DOE approved/sponsored software based on the 2015 IECC, or ASHRAE Standard 90.1-2013;** Based on Whole Building Energy Performance Simulation: DOE-2, EnergyPlus, SPARK, Building Design Advisor, etc.

**REQUIRED** – *All energy compliance documentation must be signed, sealed, stamped and dated by the appropriate design professional.*

**PART IV – RESPONSIBILITIES FOR ENERGY REVIEW/INSPECTION AND SPECIFIC SUBMITTAL REQUIREMENTS:**

The project Architect or Registered Design Professional in Responsible Charge will perform reviews/quality checks for the building design relating to energy compliance. The Architect will submit a required statement (or multiple statements from the designers, architect and engineers) that the item(s) under their responsibility were reviewed for energy compliance. Some individual energy related items ask for a number (percent/value) or a narrative be provided with the plans. Narratives must be submitted as a document in the submittal package referencing the appropriate drawing.

**PART V – LIST OF MANDATORY REQUIREMENTS OF THE 2015 IECC OR ASHRAE 90.1-2013:**

If ASHRAE 90.1-2013 is chosen, there is a **Prescriptive Path (Sections 5 through 10)** and a **Energy Cost Budget Method (Section 11)**. Designers must choose one or another;

Mandatory provisions of the **Energy Cost Budget Method (Section 11)** are:

- A. **Section 5.4 Thermal Envelope Mandatory Provisions:** Insulation, Fenestration, and Air Leakage
- B. **Section 6.4 HVAC Mandatory Provisions:** Minimum Efficiencies, Equipment Sizing, HVAC Controls, HVAC construction and Insulation, Walk-in Coolers and Freezers
- C. **Section 7.4 Service Water Heating Equipment:** Load Calculations, Equipment Efficiencies, Insulation, and Controls
- D. **Section 8.4 Electrical Mandatory Provisions:** Maximum voltage drop, Receptacle Control, Energy Monitoring; Low Voltage Dry Type Distribution Transformers
- E. **Section 9.4 Lighting Mandatory Provisions:** Lighting Controls (Interior and Exterior), Functional Testing
- F. **Section 10.4 Other Mandatory Provisions:** Electric Motors, Service Water Pressure Booster Systems, Elevators, Escalators and Moving Walkways, Whole Building Energy Monitoring
- G. **Energy Cost Budget** less than or equal to the Design Energy Cost (Software for Energy Cost Budget – DOE-2, BLAST, other software that complies with Section 11.4.1.1)

**Mandatory Provisions of the ASHRAE 90.1-2013 Prescriptive Path are:**

- A. **Section 5 Building Envelope;** Sections 5.1, 5.2, 5.3, 5.4, 5.7, 5.8 and either Section 5.5 OR Section 5.6
- B. **Section 6 HVAC;** Sections 6.1, 6.2, 6.7, and either Section 6.3 OR Section 6.4 and 6.5
- C. **Section 7 Service Water Heating;** All of Section 7
- D. **Section 8 Electrical Power;** All of Section 8
- E. **Section 9 Lighting;** Sections 9.1, 9.2, 9.4, 9.7, and either Section 9.5 OR Section 9.6.

**If the 2015 IECC path is Chosen,** there is a **Prescriptive Path (Sections C402 through C406)** and a **Total Building Performance Path (Section C407)**. Designers must choose one or another.

**Mandatory provisions of the Total Building Performance Path (Section C407) are:**

- A. Section C402.5 Air Leakage
- B. Section 403.2 HVAC; Minimum Efficiencies, Equipment Sizing, HVAC Controls, Energy Recovery Ventilators, HVAC construction and Insulation, Fan Horsepower and Efficiencies, Walk-in Coolers and Freezers
- C. Section C404 Service Water Heating
- D. Section C405 Electrical Power and Lighting
- E. Section C407 Total Building Performance; Building Energy Costs shall be equal to or less than 85% of the standard reference building design
- F. Section C408 System Commissioning

**Mandatory Provisions of the 2015 IECC Prescriptive Path are:**

- A. All of Sections C402 through C405; Building Envelope, HVAC, Service Water Heating, Power and Lighting
- B. Commercial Buildings must comply with C406 Additional Efficiency Package (Chose one of 6 options)
- C. Tenant Spaces must comply with C406.1.1 (either one of the following)
- D. Where the shell building is not in compliance, tenant spaces must comply with one of the following additional energy efficiency packages:
  - a. C406.2; or C406.3; or C406.4; or C406.6; or C406.7
  - b. Where the shell building is in compliance, comply with C406.5 On-Site Renewable Energy

## **PART VI - COMMISSIONING REQUIREMENTS:**

A Maryland State Licensed architect or engineer (*Registered Design Professional*) may perform commissioning and submit the **Preliminary Report of Commissioning** to the building owner or authorized agent.

- A. The preliminary report should include an itemization of deficiencies found that have not been corrected by the time of the report, list of deferred tests not accomplished because of climatic conditions, and conditions necessary for scheduling of deferred tests. The report should address the following in particular:
  - a. Mechanical, and service hot water commissioning – Air system balancing, hydronic systems balancing per C408.2.2.
  - b. Functional Performance Testing of Equipment and Controls per C408.2.3.
  - c. Lighting System Controls Functional Testing per C408.3.
- B. **ASHRAE - Duct Leakage Test Results** - If applicable to the project. For ducts designed to operate in excess of 3 in water gauge and all ductwork outside conditioned space per Section C403.2.9.
- C. **Pressure Testing of the Envelope Test Results** (under Section C402.5; if applicable).

**The Preliminary Report of Commissioning shall be submitted by the Architect, Engineer or the certified commissioning agent.** The items listed must address all the items in the Commissioning Plan submitted at the time of application. The preliminary commissioning report must be provided to the building owner or owner's agent. A letter of transmittal from the owner or agent verifying receipt of the preliminary commissioning report must be received by DPS prior to any Use & Occupancy inspections.

**Final building occupancy approval shall not be granted until DPS receives a letter of transmittal from the building owner verifying receipt of the preliminary commissioning report.** The Final Report of Commissioning is to be provided to the owner. *\*All documentation required by C408.2.5 shall be provided to the building owner or owner's agent within 90 days of occupancy. All reports shall be made available to DPS upon request.*

**Final building occupancy approval shall not be granted until DPS receives COMcheck *Post Construction Compliance Statement*;** the *Post Construction Compliance Statement* shall be derived directly from the COMcheck compliance documentation (inspection checklist) submitted at the time of permit application.

All reports and letters of transmittal listed above must be e-mailed to: [mark.nauman@montgomerycountymd.gov](mailto:mark.nauman@montgomerycountymd.gov)