



BROWARD COUNTY BOARD OF RULES AND APPEALS

1 N. University Drive, Suite 3500B, Plantation, FL 33324

P: 954-765-4500 | F: 954-765-4504 broward.org/CodeAppeals

1 N. University Drive, Suite 3500B
Plantation, FL 33324

Phone: 954-765-4500
Fax: 954-765-4504

broward.org/CodeAppeals

To: Members of the Energy Conservation Committee

| | | | |
|---------------|---------------|-----------------|------------|
| D. Rice, P.E. | M. Charmin | T. Fallon | W. Haygood |
| E. Jenison | A. Kamm, P.E. | B. Lomel, P.E. | J. Travers |
| D. Ulmer | B. Volin | A. Zackria, CSI | |

From: Timothy G. de Carion, Chief Energy Code Compliance Officer

Date: December 14, 2021 (1:30PM – 3:30PM)

Subj: Energy Codes

The Chairman of Energy Conservation Committee, Mr. Dave Rice P.E., called for a meeting of the Energy Conservation Committee for the items listed.

AGENDA

Roll Call

Approval of Minutes – July 29, 2021

Chairman’s Opening Remarks

Chief Energy Code Compliance Officer Opening Remarks

Regular Meeting

Item 1: Education Update

Code Class “Energy Compliance Report Review” Approval

A. BCAIB, CILB, ECLB, Approval Letters **Pg. 5**

Item 2: Miami-Dade/Broward BORA Commercial Cool Roof Code Modification

2023 Energy Code Proposal..... **Pg. 9** (Dated 04/05/2021)

A. Endorsement Letters: Pompano Beach..... **Pg. 13** (Dated 11/23/2021)

Item 3: BORA Commercial Compliance Path Form Pg. 15 (Dated 12/02/2021)

A. Example Forms from other areas..... **Pg. 17**

General Discussion

Schedule Next Meeting

Adjournment

Reference Documents for Committee Use

Item 1a) CEU Approval Letters (Pg. 5)

Item 2) Proposed Energy Code Modification (Pg. 9)

Item 2a) Endorsement Letter from Pompano Beach (Pg. 13)

Item 3) BORA Commercial Compliance Pathway Form (Pg. 15)

Item 3a) Example of pathway forms from other areas (Pg. 17)

Sunshine Law Reminder: Advisory Board members cannot communicate with each other on a possible committee or Board topic outside of a public meeting, per State statute.

2021 Voting Members

Chair

Mr. Daniel Lavrich,
P.E., S.I., SECB, F.ASCE, F.SEI
Structural Engineer

Vice-Chair

Mr. Stephen E. Bailey, P.E.
Electrical Engineer

Mr. John Famularo,
Roofing Contractor
Mrs. Shalanda Giles Nelson,
General Contractor
Mr. Daniel Rourke
Master Plumber

Mr. Gregg D’Attile,
Mechanical Contractor
Mr. Ron Burr
Swimming Pool Contractor

Mr. John Sims,
Master Electrician
Mr. Dennis A. Ulmer
Consumer Advocate
Mr. Abbas H. Zackria, CSI
Architect

Mr. Robert A. Kamm, P.E.
Mechanical Engineer

Vacant

Representative Disabled Community
Mr. Sergio Pellecer
Fire Service Professional

2021 Alternate Board Members

Mr. Jeff Falkanger
Architect
Mr. Steven Feller, P.E.
Mechanical Engineer
Mr. Alberto Fernandez,
General Contractor
Mr. Robert Taylor
Fire Service

Vacant

Structural Engineer
Mr. David Rice, P.E.
Electrical Engineer
Mr. James Terry,
Master Plumber
Mr. David Tringo,
Master Electrician
Mr. William Flett,
Roofing Contractor

Board Attorney

Charles M. Kramer, Esq.

Board Administrative Director

James DiPietro



DRAFT

BROWARD COUNTY BOARD OF RULES AND APPEALS

1 N. University Drive, Suite 3500B, Plantation, FL 33324
P: 954-765-4500 | F: 954-765-4504 | broward.org/CodeAppeals

MEETING OF THE ENERGY CONSERVATION COMMITTEE

**Minutes
July 29, 2021**

Call to Order:

Chair David Rice, P.E., R.C. Engineering, Inc., called a published meeting of the Broward County Board of Rules and Appeals Energy Conservation Committee to order at 1:34 PM.

The roll was called, and the following members were present:

Present:

| | | |
|------------------|-------------------|--------------------|
| Mike Charnin | Brian Lomel, P.E. | Dennis Ulmer |
| Wyatt T. Haygood | David Rice, P.E. | Bob Volin |
| Eric Jenison | John Travers | Abbas Zackria, CSI |

Staff: Timothy de Carion, Chief Energy Code Compliance Officer

Mr. Daniel Lavrich, P.E., S.I., SECB, F.ASCE, F.SEI, shared some of the facts of the Champlain Towers collapse with the committee members. On June 24, 2021, the Champlain Towers – South, a 12-story condominium in Surfside, Fla. partially collapsed. The collapse was sudden and complete. He reminded everyone that the proper changes will be made once the cause of the collapse is revealed.

Mr. Lavrich thanked the energy committee members for their hard work.

A MOTION WAS MADE BY MR. TRAVERS AND SECONDED BY MR. ZACKRIA TO APPROVE THE JUNE 15, 2021 ENERGY CONSERVATION COMMITTEE MEETING MINUTES. THE MOTION PASSED BY UNANIMOUS VOTE.

Chair Rice said that his goal for the current Energy Conservation Committee Meeting is to approve the current draft of the Residential Energy Code Guidelines document.

Item 1: Revision to Formal Interpretation #8

Mr. Timothy de Carion, Broward County Board of Rules and Appeals, reminded the committee of the discussion about the “Minimum Efficiency Requirement for ‘Low Height Air Handlers’” memo that took place at the June 15, 2021, meeting. In the time since, he revised Formal Interpretation #8: Recessed Ceiling Air Handlers. This revision will serve as documentation to display if systems achieve the 14-SEER requirements.

Mr. de Carion shared the revised memo with the committee. He explained that he would like to present the revised Formal Interpretation #8 to the Broward County Board of Rules and Appeals at its meeting scheduled on August 12, 2021.

Mr. de Carion added that several manufacturers are taking the steps to reach the 14-SEER requirements.

Mr. Bob Volin, Air Design Concepts, asked if the formal interpretation would hinder contractors from selling an array of varied air conditioner brands. He disclosed that some companies will not have the resources to provide a unit that meets the 14-SEER requirements. Mr. de Carion responded that if a 14-SEER system is readily available it should be used. He recommended that contractors utilize the AHRI (Air-Conditioning, Heating & Refrigeration Institute) Directory.

Chair Rice announced that the formal interpretation is not a code modification. It will serve as an interpretation of the existing code.

Mr. John Travers, City of Fort Lauderdale, mentioned the phrase “is not readily available.” He asked Mr. de Carion since replacements permits are typically handled quickly, how much investigating is the building department expected to do.

Chair Rice said that since “readily available” is vague, he believes that the level of investigation should be decided by each municipality’s AHJ (Authority Having Jurisdiction).

Mr. Michael Charnin, City of Plantation, stated that as a plan reviewer, most of the emergency permits that are received by the municipality have already been installed.

Mr. Volin estimated that there are so many units being installed without a permit, that most municipalities would be willing to work with the minority of contractors that are complying with protocols.

A MOTION WAS MADE BY MR. HAYGOOD AND SECONDED BY MR. CHARNIN TO PRESENT THE REVISED FORMAL INTERPRETATION #8: RECESSED CEILING AIR HANDLERS TO THE BROWARD COUNTY BOARD OF RULES AND APPEALS. THE MOTION PASSED BY UNANIMOUS VOTE.

Item 2: BORA Residential Energy Guidelines (Revision 07-29-2021)

Mr. de Carion presented the BORA Residential Energy Guidelines document to the committee. The current draft is the fifth revision. Mr. de Carion announced that his goal for the current draft is for it to be presented to the Broward County Board of Rules and Appeals at its meeting scheduled on August 12, 2021.

Mr. de Carion shared his screen so that everyone could follow along as he presented the BORA Residential Energy Guidelines document in its current state. He updated the committee members about the revisions that he made as of July 29, 2021.

Mr. Wyatt T. Haygood, City of Parkland, reported that in the City of Parkland, the Energy Calc. Form has always assigned to the structural department. He said that after this discussion he agrees that all the disciplines of the building department should be included in the Energy Calc. Form.

Chair Rice commented that the Energy Code is a very challenging code to interpret.

A MOTION WAS MADE BY MR. ZACKRIA AND SECONDED BY MR. LOMEL TO SEND THE DOCUMENT TO THE BOARD PENDING BY REVIEW OF THE ATTORNEY. THE MOTION PASSED BY UNANIMOUS VOTE.

Mr. Travers shared that when he was a plans examiner for the City of Hialeah, he relied on a 106-point checklist. Mr. Travers believes that the BORA Residential Energy Guidelines document will be helpful to the code officials that utilize it.

Mr. de Carion informed the committee that the next Energy Conservation Committee meeting will most likely be scheduled in four weeks, at the end of August.

Chair Rice reiterated the Sunshine Law to the committee members. Since the Sunshine Law declares that per State statute, Advisory Board members cannot communicate with each other on a possible committee or Board topic outside of a public meeting, all comments and questions must be submitted to Mr. de Carion.

A MOTION WAS MADE BY MR. CHARNIN AND SECONDED BY MR. LOMEL TO ADOUJORN THE ENERGY CONSERVATION COMMITTEE MEETING. THE MOTION PASSED BY UNANIMOUS VOTE.

Adjournment

Having no further business to go before the Committee, the meeting adjourned at 2:32 PM.

Item 1a:

Code Class “Energy Compliance Report Review” Approval
BCAIB, CILB, ECLB, Approval Letters

Julie I. Brown, Secretary

Ron DeSantis, Governor

October 26, 2021

BROWARD COUNTY BOARD OF RULES & APPEALS
1 N. UNIVERSITY DR., STE. 3500-B
SUITE 114
PLANTATION, FL 33324

Board: 5027
File: 4100
Appl: 5385
Course Number: 5008986
Course License: CRS3286
Approved Hours: 2
Expiration Date: 10/25/2023

Building Code Administrators and Inspectors Board Course Approval
Title: ENERGY COMPLIANCE REPORT REVIEW

Dear BROWARD COUNTY BOARD OF RULES & APPEALS

The application for the course, ENERGY COMPLIANCE REPORT REVIEW has been approved. The course designation number and title shall be utilized on all advertising, promotional material and communication with the board office.

This approval only verifies your compliance with the filing and disclosure requirements of the Florida Administrative Code, and does not constitute the Department's endorsement of the courses.

Be advised that the Florida Statutes and Florida Administrative Code are subject to change. It is your responsibility to ensure that your course material reflects all current requirements.

As an approved education provider, you are required to provide electronic files to the department within thirty (30) business days of the completion of each continuing education course. Courses must be taught in their entirety before they are reported to the Department as partial credits are not permitted.

Provided below are additional details regarding your approved course. To make any changes to instructors and/or course version, please notify the Department in writing, on company letterhead signed by your registered authorized representative. Any changes to the method of delivery or credit category will require the submission of a new initial course application.

COURSE DETAILS

COURSE DELIVERY METHOD: DISTANCE/ONLINE.
CATEGORY: ENERGY.
INSTRUCTORS: TIMOTHY GRAHAM DECARION.

If you should have any questions regarding the Department's Continuing Education Program, please contact the department at 850.487.1395.

Sincerely,

Bureau of Education and Testing
Department of Business and Professional Regulation



Julie I. Brown, Secretary

Ron DeSantis, Governor

September 16, 2021

BROWARD COUNTY BOARD OF RULES & APPEALS
1 N. UNIVERSITY DR., STE. 3500-B
PLANTATION, FL 33324

Board: 0630
File: 15682
Appl: 25327
Course Number: 0614049
Course License: CRS12700
Approved Hours: 2
Expiration Date: 09/15/2024

Construction Industry Licensing Board Course Approval
Title: ENERGY COMPLIANCE REPORT

Dear BROWARD COUNTY BOARD OF RULES & APPEALS

The application for the course, ENERGY COMPLIANCE REPORT has been approved. The course designation number and title shall be utilized on all advertising, promotional material and communication with the board office.

This approval only verifies your compliance with the filing and disclosure requirements of the Florida Administrative Code, and does not constitute the Department's endorsement of the courses.

Be advised that the Florida Statutes and Florida Administrative Code are subject to change. It is your responsibility to ensure that your course material reflects all current requirements.

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Provided below are additional details regarding your approved course. To make any changes to instructors and/or course version, please notify the Department in writing, on company letterhead signed by your registered authorized representative. Any changes to the method of delivery or credit category will require the submission of a new initial course application.

COURSE DETAILS

Online-(GEN) Instructor(s): Timothy De Carion

If you should have any questions regarding the Department's Continuing Education Program, please contact the department at 850.487.1395.

Sincerely,

Bureau of Education and Testing
Department of Business and Professional Regulation



Julie I. Brown, Secretary

Ron DeSantis, Governor

November 23, 2021

BROWARD COUNTY BOARD OF RULES & APPEALS
1 N. UNIVERSITY DR., STE. 3500-B
PLANTATION, FL 33324

Board: 0817
File: 5644
Appl: 12633
Course Number: 0802611
Course License: CRS4542
Approved Hours: 2
Expiration Date: 05/31/2023

Electrical Contractors' Licensing Board Course Approval
Title: ENERGY COMPLIANCE REPORT REVIEW

Dear BROWARD COUNTY BOARD OF RULES & APPEALS

The application for the course, ENERGY COMPLIANCE REPORT REVIEW has been approved. The course designation number and title shall be utilized on all advertising, promotional material and communication with the board office.

This approval only verifies your compliance with the filing and disclosure requirements of the Florida Administrative Code, and does not constitute the Department's endorsement of the courses.

Be advised that the Florida Statutes and Florida Administrative Code are subject to change. It is your responsibility to ensure that your course material reflects all current requirements.

As an approved education provider, you are required to provide electronic files to the department within thirty (30) business days of the completion of each continuing education course. Courses must be taught in their entirety before they are reported to the Department as partial credits are not permitted.

Provided below are additional details regarding your approved course. To make any changes to instructors and/or course version, please notify the Department in writing, on company letterhead signed by your registered authorized representative. Any changes to the method of delivery or credit category will require the submission of a new initial course application.

COURSE DETAILS

Online; (TEC); Instructor Timothy G. DeCarion

If you should have any questions regarding the Department's Continuing Education Program, please contact the department at 850.487.1395.

Sincerely,

Bureau of Education and Testing
Department of Business and Professional Regulation



Item 2:

Miami-Dade/Broward BORA Commercial Cool Roof Code
Modification

Date 4/5/2021

| | |
|-----------------|-------------------------|
| Modification # | XXXX |
| Name | Miami-Dade/Broward BORA |
| Address | XXXX |
| City | Miami-Dade/Broward |
| State | Florida |
| Zip Code | XXXX |
| Email | XXXX |
| Primary Phone | XXXX |
| Alternate Phone | XXXX |
| Fax | XXXX |

| | |
|-----------------------|--------------------------------------|
| Code Version | 2023 |
| Code Change Cycle | 2023 Triennial Modification date XXX |
| Code Change # | XXXX |
| Staff Classification | _____ |
| Sub Code | Energy Conservation |
| Chapter and Topic | C303.1.5 and Table C402.3 |
| Related Modifications | _____ |

Summary

This proposed modification increases the two compliance requirement options to the roof system solar reflectance values for low-slope roofs on commercial/nonresidential buildings directly above conditioned spaces and it is only applicable to Climate_Zone 1A. (Zone 1A consists of Broward, Collier, Henry, Lee, Miami-Dade, Monroe, and_Palm Beach counties).

Text of Modification

ADD Section C303.1.5 to Chapter 3 General

C303.1.5 Roof solar reflectance and thermal emittance

Low-sloped roofs directly above cooled conditioned spaces in Climate Zones 1a shall comply with one or more of the options in Table C402.3.

C402.3 Roof solar reflectance and thermal emittance.

Low-sloped roofs directly above cooled conditioned spaces in Climate Zones 1, 2 and 3 shall comply with one or more of the options in Table C402.3.

Exceptions: The following roofs and portions of roofs are exempt from the requirements of Table C402.3:

1. Portions of the roof that include or are covered by the following:
 - 1.1. Photovoltaic systems or components.
 - 1.2. Solar air or water-heating systems or components.
 - 1.3. Roof gardens or landscaped roofs.
 - 1.4. Above-roof decks or walkways.
 - 1.5. Skylights.
 - 1.6. HVAC systems and components, and other opaque objects mounted above the roof.
2. Portions of the roof shaded during the peak sun angle on the summer solstice by permanent features of the building or by permanent features of adjacent buildings.
3. Portions of roofs that are ballasted with a minimum stone ballast of 17 pounds per square foot [74 kg/m²] or 23 psf [117 kg/m²] pavers.
4. Roofs where not less than 75 percent of the roof area complies with one or more of the exceptions to this section.

TABLE C402.3 MINIMUM ROOF REFLECTANCE AND EMITTANCE OPTIONS ^a

| |
|---|
| Three-year aged solar reflectance ^b of 0.55 (0.63 for Climate Zone 1A) and 3-year aged thermal emittance ^c of 0.75 |
| Three-year-aged solar reflectance index ^d of 64 (75 for Climate Zone 1A) |

^a. The use of area-weighted averages to comply with these requirements shall be permitted. Materials lacking 3-year-aged tested values for either solar reflectance or thermal emittance shall be assigned both a 3-year-aged solar reflectance in accordance with Section C402.3.1 and a 3-year-aged thermal emittance of 0.90.

^b. Aged solar reflectance tested in accordance with ASTM C1549, ASTM E903 or ASTM E1918 or CRRC-1 Standard.

^c. Aged thermal emittance tested in accordance with ASTM C1371 or ASTM E408 or CRRC-1 Standard.

^d. Solar reflectance index (SRI) shall be determined in accordance with ASTM E1980 using a convection coefficient of 2.1 Btu/h · ft² · °F (12W/m² · K). Calculation of aged SRI shall be based on aged tested values of solar reflectance and thermal emittance.

Rationale

This proposed modification increases the roofing systems solar reflectance which will lead to less heat transmission into the building, resulting in a reduced cooling load demand, and a consequent decrease on energy consumption. By decreasing roof temperature, the life of the roof may be extended. This proposal also provides secondary benefits, such as reduced urban heat island effect.

Cost

Most low slope commercial roofs currently use single-ply roof coverings, where most of these products already meet the proposed level of performance. Therefore, implementing this change will have little cost effect on single-ply roof projects.

Built-up roofs do require an upgraded energy performing cap sheet, and this results in a 20% material cost increase for this upgraded cap sheet on most of these roof projects. Applying an energy star roof covering (coating) has a similar 20% increase in cost.

The cost increase of 20% is based on the example of a standard new construction, two-ply and a mineral surfaced cap sheet built-up roof costing \$275 per square. The cost difference between a regular mineral surfaced cap sheet and an energy compliant cap sheet is \$50 per square. The \$50 increase is approximately 20%.

If the contractor elected to apply a coating over the regular cap sheet to achieve energy compliance, the increase in material (i.e., coating) and additional labor to apply coating would cost approximately the same 20% per square.

Item 2a:

Endorsement Letters: Pompano Beach



DEPARTMENT OF DEVELOPMENT SERVICES
CITY OF POMPANO BEACH
BUILDING INSPECTIONS DIVISION
100 West Atlantic Boulevard – Room 360

Date: November 23, 2021
To: Broward County Board of Rules and Appeals
From: Michael Rada, Building Official
Subject: Energy Conservation Code Modification

Gentlemen.

Thank you for the opportunity for our Building Department to opine on the proposed modification to the Energy Conservation Code.

The municipality of the City of Pompano Beach has a current population of over 100,000 residents. We have districts of Commercial, Industrial and Residential use throughout our City and are experiencing very aggressive growth in all aspects of construction.

Our Leadership has maintained a progressive vision of sustainability for all future development within our City.

We believe the proposed modification to the Energy Conservation Code to adopt an increase in solar reflectance for all new Commercial roofs would have a huge impact on limiting greenhouse emissions and overall energy consumption.

We sincerely appreciate your consideration for allowing the City of Pompano Beach to support your endeavor.

Respectfully.

Michael Rada, Building Official
City of Pompano Beach

Item 3:

BORA Commercial Compliance Path Form



Energy Compliance Path

2020 Florida Energy Conservation Code C401.2

(To be completed before building permit is issued)

PROJECT ADDRESS _____ **PERMIT NUMBER** _____

TYPE OF CONSTRUCTION NEW CONST. ADDITION ALTERATION CHANGE OF OCCUPANCY

Florida Energy Conservation Code Compliance Options

Code Section

Select #1, #2, or #3 per C401.2 of FECC

- Option 1) ANSI/ASHRAE/IESNA 90.1** excluding 9.4.1(g), 8.4.2, 8.4.3 (2016 Version) C401.2 #1
- Option 2) FECC Prescriptive Method** complying with C402 thru C405 & C408 & C406. C401.2 #2
Tenant spaces shall also comply with C406.1.1
- Option 3) FECC Performance Method** with mandatory compliance of C402.5, C403.2, C404, C405.2, C405.4, C405.5, C407, and C408. (85% of standard reference design required) C401.2 #3

Option #1 ANSI/ASHRAE/IESNA 90.1 (2016 Version)

Code Section

Select #1, #2, or #3 per 4.2.1 of ASHRAE 90.1

- 1) Prescriptive Method** complying with 5.5, 6.5, 7.5, (9.5 or 9.6) 4.2.1.1a
- 2) Energy Cost Budget Method** complying with Section 11 4.2.1.1b
- 3) Performance Rating Method** complying with Appendix G 4.2.1.1c

Option #2 FECC Prescriptive

Code Section

Select Envelope and Efficiency Package Options below:

Envelope Select one method per C402.1 #1

- 1. Insulation Component R-Value method.** (Table C402.1.3) C402.1.3
- 2. Assembly U-Factor, C-Factor, or F factor-based method** (Table C402.1.4) C402.1.4
- 3. Component performance alternative** in lieu of Table C402.1.4 above. C402.1.5

Efficiency Package Select one additional package per C406.1

- More efficient HVAC performance C406.2
- Reduced lighting power density C406.3
- Enhanced digital lighting controls C406.4
- Onsite renewable energy C406.5
- Reduced energy use in service water heating C406.6
- Load Fraction SHWH C406.7

Option #3 FECC Performance

Code Section

Credit Options Claimed

- Vegetative Roofs C407.5.2.4
- Enthalpy Recovery Ventilation C407.5.2.4.1
- Enthalpy Recovery Ventilation C407.5.2.4.2

Item 3a:

Example Forms from other areas

Energy Code Compliance

- STEP 1** Select ONLY ONE compliance method for the entire project using this form. 1a, 1b, 2, or 3
- STEP 2** Under selected compliance method, select ONE option from each section
- STEP 3** Prepare forms, reports or other documentation as indicated for the method and path chosen
- STEP 4** Prepare ENERGY CODE COMPLIANCE DRAWING SHEET(S) see front of worksheet for requirements
- STEP 5** Submit items from Steps 1-4 and other construction documents with permit application package

1a. ASHRAE Standard Compliance for NEW COMMERCIAL BUILDINGS, ADDITIONS, ALTERATIONS & REPAIRS

Comply with the provisions of the following ASHRAE 90.1-2010 sections 5-10: Select one option from each section and submit required documentation.

Section 5 Building Envelope

- PRESCRIPTIVE BUILDING ENVELOPE OPTION
Submit **Standard 90.1-2010: Building Envelope Compliance Forms - Part 1 and Part 2**
- BUILDING ENVELOPE TRADE-OFF OPTION
Submit **Standard 90.1-2010: Building Envelope Compliance Forms - Part 1** and **COMcheck report** for the ASHRAE building envelope trade-off option

Section 6 Heating, Ventilation and Air Conditioning

- HVAC SIMPLIFIED APPROACH OPTION
Submit **Standard 90.1-2010: HVAC Compliance Forms - Part 1**
- HVAC MANDATORY PROVISIONS and PRESCRIPTIVE PATH
Submit **Standard 90.1-2010: HVAC Compliance Forms - Part 2 and Part 3**

Section 7 Service Water Heating

- PRESCRIPTIVE PATH
Submit **Standard 90.1-2010: Service Water Heating Compliance Forms**

Section 8 Power

Only one compliance path is available for power distribution systems

Section 9 Lighting

- BUILDING AREA METHOD
Submit **Standard 90.1-2010: Lighting Compliance Forms**
- SPACE-BY-SPACE METHOD
Submit **Standard 90.1-2010: Lighting Compliance Forms**

Section 10 Other Equipment

Comply with provisions of Section 10.

1b. ASHRAE Energy Cost Budget Compliance for NEW BUILDINGS and ADDITION

Comply with the provisions of ASHRAE 90.1 2010 Section 11 Energy Cost Budget. See additional handout for submittal requirements for this compliance method.

2. IECC Prescriptive Compliance for NEW BUILDINGS, ADDITIONS, ALTERATIONS & REPAIRS

Comply with the provisions of the following INTERNATIONAL ENERGY CONSERVATION CODE (IECC), MN RULES CHAPTER 1323 sections: Select one option from Section C403.

Section C402 Building Envelope Requirements

Section C403 Building Mechanical Systems

Comply with mandatory provisions and either:

- Section C403.3 Simple systems
- Section C403.4 Complex systems

Section C404 Service Water Heating

Section C405 Electrical Power and Lighting Systems

For NEW BUILDINGS ONLY

Section C406 Additional Efficiency Packages

Comply with at least one of the following:

- Section C406.2 Efficient HVAC Performance
- Section C406.3 Efficient Lighting System
- Section C406.4 On-Site Supply of Renewable Energy

Submit COMcheck reports or other documentation to show compliance with IECC for all sections.

3. IECC Total Building Performance for NEW BUILDINGS

Comply with the IECC MN RULES CHAPTER 1323 C401.2 (3). See additional handout for submittal requirements for this compliance method.



Department of Development Services
Building Inspections

City of Denton Texas 2015 IECC Commercial Energy
Compliance Certificate Path
(for new construction, additions, and first finish outs)

PROVIDE THIS FORM AT PERMIT SUBMITTAL

Permit Address: _____ **Permit #:** _____
Testing Company: _____
Testing Company: _____

Selected Compliance Path (select one of the following):

Option 1A – ASHRAE 90.1 (2013) Prescriptive: Section 10 (May use COMcheck to demonstrate compliance.)

- | | |
|-----------------------------------|------------------------------|
| Section 5 – Building Envelope | Section 8 – Power |
| Section 6 – HVAC | Section 9 – Lighting |
| Section 7 – Service Water Heating | Section 10 – Other Equipment |

Option 1B – ASHRAE 90.1 (2013) Section 11 Energy Cost Budget Method: Section 5.4, 6.4, 7.4, 8.4, 9.4, and 10.4; design energy cost (Sec. 11.5) \leq energy cost budget (Sec. 11.4); and energy efficiency level of components specified meet or exceed energy efficiency levels used to calculate energy costs.

Option 2 – IECC Prescriptive (May use COMcheck to demonstrate compliance.)

- | | |
|--|--|
| C402 – Building Envelope Requirements | C404 – Service Water Heating (Mandatory) |
| C403 – Building Mechanical Systems | C405 – Electrical Power and Lighting Systems |
| C406 – Additional efficiency package options (must choose one) | |
| C406.2 – More efficient HVAC Performance | C406.5 – On-site supply of renewable energy |
| C406.3 – Reduced lighting power density | C406.6 – Provisions of a dedicated OA system |
| C406.4 – Enhanced lighting controls | C406.7 – High-efficiency service water heating |

Option 3 – Total Building Performance: building energy cost < 85% of standard reference design.

- | | |
|--|--|
| C402.5 – Air Leakage – thermal envelope (Mandatory) | C405.3 – Exit Signs (Mandatory) |
| C403.2 – Provisions applicable to all Mechanical Systems (Mandatory) | C405.4 – Interior Lighting and Power Requirements (Prescriptive) |
| C404 – Service Water Heating (Mandatory) | C405.6 – Electrical Energy Consumption (Mandatory) |
| C405.2 – Lighting Controls (Mandatory) | C407 – Total Building Performance |

NOTE: Mechanical cooling systems over 480,000 Btuh and service water-heating/space-heating systems over 600,000 Btuh (combined capacity); and, controls for automatic lighting systems require certain information on construction documents and system commissioning and reports in accordance with section C408

I certify that I have reviewed the construction documents including, but not necessarily limited to, insulation materials and R-values; fenestration U-factors and SHGC values; area-weighted average U-factor and SHGC calculations; mechanical system design criteria; mechanical and service water heating system and equipment types, sizes and efficiencies; equipment and systems controls; duct sealing, duct and piping insulation and location; and air sealing details; and that the project as designed satisfies the minimum requirements for the compliance approach selected above.

Print Name: _____ **Certification Number:** _____

Energy Rater/Preparer Company: _____

Signature of Energy Rater/Preparer: _____ **Date:** _____

ATTACH THE APPLICABLE COMPLIANCE REPORT



**Planning, Development & Transportation Services
Community Development & Neighborhood Services**

2018 COMMERCIAL ENERGY CODE COMPLIANCE FORM

FORM 2 - Use this form for all commercial buildings including residential buildings 4 stories or more.

| | |
|----------------|----------|
| Permit Number: | Address: |
|----------------|----------|

DIRECTIONS: Place a check (✓) next to energy compliance path chosen. A passing Air tightness test is required showing total building leakage less than 0.25 cfm/sq ft at 75 Pascals pressure.

| (A) PRESCRIPTIVE compliance, 2018 IECC, section C402.2, climate zone 5. | | |
|--|---------------------------------------|---------------------------------------|
| BUILDING ENVELOPE | INSULATION R-VALUE | ELECTRICALLY HEATED R-VALUE |
| Roof insulation in attic | R-38 | R-49 |
| Insulation entirely above roof deck | R-30 | R-30 |
| Metal building roof | R-19+R-11 Liner System | R-19+R-11 Liner System |
| Wood frame wall insul R-Value | R-13+R-3.8ci* or R-20 | R-15+7.5ci* or R-19+5ci* |
| Metal frame wall insul R-Value | R-13+R-7.5ci* | R-13+10ci* |
| Mass wall (concrete, cmu) | R-11.4ci* | R-15ci* |
| Wood floor (over unconditioned space) | R-30 | R-38 |
| Crawl space wall | R-10 FULL DEPTH | R-10 FULL DEPTH |
| Slab on grade floor - Unheated slab (insulation must extend to top of slab) | R-10, 24" DEEP | R-10, 24" DEEP |
| Slab on grade floor - Heated slab (insulation must extend to top of slab) | R-15, 36" DEEP+R-5 Below FULL SLAB | R-15, 36" DEEP+R-5 Below FULL SLAB |
| Walls below grade | R-10 FULL DEPTH | R-10ci* |
| Windows | U-0.38 | U-0.25 (non-metal) |

*ci denotes Continuous Insulation (ie: insulation such as rigid foam board that's not broken by framing cavity)

| |
|--|
| (B) Component Performance Alternative (COMcheck), 2018 IECC, C402.1.5 |
|--|

Submit a passing UA calculation (i.e. COMcheck). The report must be submitted at time of application and must include address and name of Designer/Contractor. **Note:** It's the responsibility of the party using COMcheck to use the most current version of the software. COMcheck-Web is permitted.

| |
|--|
| (C) PERFORMANCE-BASED COMPLIANCE, 2018 IECC, C407.3 |
|--|

An energy model must be submitted showing the proposed building has an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. The report must include address, inspection checklist, name of modeling agent and name and version of software.

| |
|---|
| (D) ANSI/ASHRAE/IESNA 90.1 Alternate, 2018 IECC, SECTION 401.2 |
|---|

ASHRAE 90.1 contains a prescriptive and performance path method of energy compliance. Plans must show prescriptive compliance or provide documentation of performance path.

Contractor or Applicant: _____ Date: ____/____/____

Signature: _____ Phone:(____) _____



2018 IECC Residential Energy Efficiency Code Requirements Flow Chart



In accordance with Maryland Building Performance Standards and the currently adopted Harford County Building Code all residential structures must comply with the 2018 International Energy Conservation Code. All of the Mandatory provisions and either the Prescriptive or Performance based approach must be followed.

Building Thermal Envelope Compliance Exception
R402.1 General (Prescriptive). The following buildings, or portions thereof, separated from the remainder of the building by *building thermal envelope* assemblies complying with this section shall be exempt from the *building thermal envelope* provisions of Section R402.

- Those with a peak design rate of energy usage less than 3.4 Btu/h · ft² (10.7 W/m²) or 1.0 watt/ft² (10.7 W/m²) of floor area for space conditioning purposes.
- Those that do not contain *conditioned space*.

Mandatory Requirements

| | |
|--|---|
| Section R401.3 Certificate | Section R403.5.1 Heated water circulation & temperature maintenance systems |
| Section R402.4 Air Leakage | Section R403.6 Mechanical ventilation |
| Section R402.5 Maximum fenestration U-factor and SHGC | Section R403.7 Equipment sizing & efficiency rating |
| Section R403.1 HVAC Controls | Section R403.8 Systems serving multiple dwelling units |
| Section R403.1.2 Heat Pump Supplementary Heat | Section R403.9 Snow melt & ice system controls |
| Section R403.3.2 Duct Sealing | Section R403.10 Pools and in-ground permanent spa energy consumption |
| Section R403.3.3 Duct Testing | Section R403.11 Portable Spas |
| Section R403.3.5 Building Cavities as ducts or plenums | Section R404.1 Lighting Equipment |
| Section R403.4 Mechanical system piping insulation | Section R404.1.1 Fuel gas lighting systems shall not have continuously burning pilot lights |

Choose one of the Compliance Methods below

R-Value Computation Method
R402.1.3 General

R402.1.1 Vapor Retarder
R402.1.2 Insulation and Fenestration Criteria
R402.1.3 R-Value Computation
R402.2.1 Ceilings with Attic Spaces
R402.2.2 Ceilings without attic spaces
R402.2.3 Eave Baffle
R402.2.4 Access Hatches and Doors
R402.2.5 Mass Walls
R402.2.6 Steel-Frame Ceilings, Walls and Floors
R402.2.7 Walls with partial structural sheathing
R402.2.8 Floors
R402.2.9 Basement Walls
R402.2.10 Slab-on-Grade Floors
R402.2.11 Crawl Space Walls
R402.2.12 Masonry Veneer
R402.2.13 Sunroom insulation
R402.3 Fenestration
R402.3.1 U-factor
R402.3.5 Sunroom Fenestration
R402.3.1 Insulation
R403.3.4 Duct Leakage
R403.5.3 Hot Water pipe Insulation

U-Factor Alternative
R402.1.4 General

R402.1.1 Vapor Retarder
R402.1.2 Insulation and Fenestration Criteria
R402.1.4 U-Factor Alternative
R402.2.3 Eave Baffle
R402.2.4 Access Hatches and Doors
R402.2.5 Mass Walls
R402.2.6 Steel-Frame Ceilings, Walls and Floors
R402.2.8 Floors
R402.2.9 Basement Walls
R402.2.10 Slab-on-Grade Floors
R402.2.11 Crawl Space Walls
R402.2.12 Masonry Veneer
R402.2.13 Sunroom insulation
R402.3 Fenestration
R402.3.1 U-factor
R402.3.5 Sunroom Fenestration
R403.3.1 Insulation
R403.3.4 Duct Leakage
R403.5.3 Hot Water pipe Insulation

Total UA-Alternative
R402.1.5 General

R402.1.1 Vapor Retarder
R402.1.2 Insulation and Fenestration Criteria
R402.1.5 Total UA Alternative
R402.2.3 Eave Baffle
R402.2.4 Access Hatches and Doors
R402.2.5 Mass Walls
R402.2.6 Steel-Frame Ceilings, Walls and Floors
R402.2.8 Floors
R402.2.9 Basement Walls
R402.2.10 Slab-on-Grade Floors
R402.2.11 Crawl Space Walls
R402.2.12 Masonry Veneer
R402.2.13 Sunroom insulation
R402.3 Fenestration
R402.3.1 U-factor
R402.3.5 Sunroom Fenestration
R403.3.1 Insulation
R403.3.4 Duct Leakage
R403.5.3 Hot Water pipe Insulation

Performance
R405 Simulated Performance Alternative

R405.1 Scope
R405.2 Mandatory Requirements
R405.3 Performance-Based Compliance
R405.4 Documentation
R405.4.1 Compliance Software
R405.4.2 Compliance Report
R405.4.2.1 Compliance Report for Permit Application
R405.4.2.2 Compliance Report for Certificate of Occupancy
R405.4.3 Additional Documentation
R405.5 Calculation Procedure
R405.5.1 General
R405.5.2 Residence Specifications
R405.6 Calculation Software Tools
R405.6.1 Minimum Capabilities
R405.6.2 Specific Approval
R405.6.3 Input Values

Energy Rating Index
R406 Energy Rating Index Compliance Alternative

R406.1 Scope
R406.2 Mandatory Requirements
R406.3 Energy Rating Index
R406.3.1 ERI Reference Design
R406.4 ERI-Based Compliance
R406.5 Verification by Approved Agency
R406.6 Documentation
R406.6.1 Compliance Software Tools
R406.6.2 Compliance Report
R406.6.3 Additional Documentation
R406.7 Calculation Software Tools
R406.7.1 Minimum Capabilities
R406.7.2 Specific Approval
R406.7.3 Input Values



2018 IECC Residential Energy Efficiency Code

All new residential one and two family dwellings and additions to existing one and two family dwellings must comply with the residential provisions of the 2018 IECC unless the building is considered a "Low Energy Building" as defined in Section R402.1. Additions, alterations, renovations or repairs to single family dwellings can comply with the code without requiring the unaltered portion(s) to comply. An addition shall be deemed to comply with the code if the addition alone complies or if the existing building and addition comply with the code as a single building.

In addition to the mandatory provisions of the code, the Department must be advised by the applicant of the chosen compliance path by checking the applicable box. Additional detailed information on the mandatory provision and the provisions within each compliance path can be found in the Harford County Energy Code Compliance Check List. Additional compliance documentation must be submitted with this form for the Prescriptive UA Alternative, the Simulated Performance Alternative or the Energy Rating Index Compliance alternative path is selected.

Mandatory Requirements
All provisions must be complied with regardless of the compliance

Select One of the following

Prescriptive R-Value

| Climate Zone | Fenestration U-Factor | Skylight U-Factor | Glazed Fenestration SHGC | Ceiling R-value | Wood Frame Wall R-value | Mass Wall R-value | Floor R-value | Basement Wall R-value | Slab R-value & Depth | Crawl Space Wall R-value |
|-----------------|-----------------------|-------------------|--------------------------|-----------------|-------------------------|-------------------|---------------|-----------------------|----------------------|--------------------------|
| 4 Except Marine | 0.32 | 0.55 | 0.40 | 49 | 20 or 13+5 | 8/13 | 19 | 10/13 | 10, 2ft | 10/13 |

Prescriptive U-Factor

| Climate Zone | Fenestration U-Factor | Skylight U-Factor | Ceiling U-Factor | Wood Frame Wall U-Factor | Mass Wall U-Factor | Floor U-Factor | Basement Wall U-Factor | Crawl Space Wall U-Factor |
|-----------------|-----------------------|-------------------|------------------|--------------------------|--------------------|----------------|------------------------|---------------------------|
| 4 Except Marine | 0.32 | 0.55 | 0.026 | 0.060 | 0.098 | 0.047 | 0.059 | 0.065 |

Total UA Alternative
Must Submit Compliance Documentation

Simulated Performance Alternative
Must Submit Compliance Documentation

ERI Compliance Alternative
Must Submit Compliance Documentation
Max Score = 62

Applicant/Project Information

New Single Family Dwelling:

Addition:

Addition is thermally isolated from existing construction

Permit Applicant: _____
(Signature)

(Print Name)

Date: _____

Must be completed by Applicant

Permit Number: _____ Department Approval: _____

Additional documentation received:

Additional information regarding the requirements of the 2018 IECC as adopted by Harford County can be obtained by calling the Building Services Division at (410) 638-3366. Local amendments and the 2018 I-codes can be referenced at <http://www.harfordcountymd.gov/DILP/index.cfm?ID=321>

Residential Energy Code Compliance Path

Energy Code Requirements of the 2015 IRC, Ch. 11 or the 2015 IECC, Residential Provisions

Please complete and submit with the building permit application for the following projects: *remodels; conditioned, habitable additions (which may also entail some degree of remodeling); slab elevations; new single-family homes*

Project Address: _____

IRC Sec. N1101.13 (IECC Sec. R401.2) – Projects shall comply with one of the following pathways:

- Option #1a – Prescriptive: Sections N1101.14 (R401) through N1104 (R404)**
 - N1102 (R402) - Building Thermal Envelope [Using Table N1102.1.2 (R402.1.2) - INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT]
 - N1103 (R403) - Systems.
 - N1104 (R404) - Electrical Power and Lighting Systems.
 - *Plus all mandatory provisions.*

- Option #1b – Prescriptive Total UA Alternative: Sections N1101.14 (R401) through N1104 (R404)**
 - N1102 (R402) - Building Thermal Envelope
 - N1103 (R403) - Systems.
 - N1104 (R404) - Electrical Power and Lighting Systems.
 - *Plus all mandatory provisions.*

- Option #2 – Simulated Performance Alternative Approach: Section N1105 (R405)**
 - *Plus all mandatory provisions.*
 - *May require the submittal of a standard referenced design if staff isn't familiar with the software program utilized.*

- Option #3 – Energy Rating Index Compliance Alternative: Section N1106 (R406)**
 - * Minimum envelope requirements \geq the levels of efficiency and SHGC of the 2009 IECC Table 402.1.2 or 402.1.4.*
 - *Plus all mandatory provisions of the 2015 IRC (IECC).*
 - *Plus the prescriptive hot water piping insulation. See the 2015 N1103.5.3 (R403.5.3).*

NOTE: Attach appropriate "compliance report" (unless Option 1a) and see the next page.

I certify that I have reviewed the construction documents including -- but not necessarily limited to -- the following energy code information (2015 IRC Sec. N1101.2 or the 2015 IECC R103.2), as applicable and if not applicable, as to why:

- Insulation materials and their R-values.
 N/A: _____

- Fenestration U-factors and SHGC (solar heat gain coefficients).
 N/A: _____

- Area-weighted U-factor and SHGC calculations.
 N/A: _____

- Mechanical system design criteria (ex: Manual J).
 N/A: _____

- Mechanical and service water-heating system and equipment types, sizes and efficiencies (Manual S).
 N/A: _____

- Equipment and systems controls (Manual T).
 N/A: _____

- Duct sealing, duct and pipe insulation and location (Manual D).
 N/A: _____

- Air sealing details -- which must also include a depiction of the thermal envelope.
 N/A: _____

I also certify that the construction documents and any supporting documentation, as designed, satisfy the minimum requirements for the compliance approach selected.

Print Name: _____ **Sign Name:** _____

Date: _____

This form derives from that prepared July 2016 by the Energy and Green Advisory Board of the Regional Codes Coordinating Committee, a committee of the North Central Texas Council of Governments (NCTCOG) @: www.nctcog.org/envir/codes.

COMMERCIAL NEW CONSTRUCTION
Massachusetts Energy Code 9th Edition
Plan Review Checklist for IECC Compliance Paths
 (To be completed before building permit is issued)



Applicant Name _____ Applicant Phone _____

Project Address _____

Type of Construction:

| | | | |
|--|--|--|---|
| <input type="checkbox"/> New Construction | <input type="checkbox"/> Addition | <input type="checkbox"/> Alteration | <input type="checkbox"/> Change of Occupancy |
|--|--|--|---|

| | | |
|--|--|--|
| Select Compliance Path (C401.2): | | |
| <input type="checkbox"/> #1: ASHRAE Standard 90.1 (select one): | | |
| <input type="checkbox"/> Prescriptive Path | <input type="checkbox"/> Chapter 11 | <input type="checkbox"/> Appendix G |
| <input type="checkbox"/> #2: IECC Prescriptive Path | | |
| <input type="checkbox"/> #3: IECC Performance Path | | |
| <input type="checkbox"/> #4: 780 CMR 51.00: Massachusetts Residential Code (Residential Buildings up to 5 stories only) | | |
| <input type="checkbox"/> RESNET HERS Rating | <input type="checkbox"/> ENERGY STAR Homes | <input type="checkbox"/> Passive House (PHIUS) |

| | | |
|--|---|---|
| Compliance Path # 1: ASHRAE Standard 90.1 | | |
| For Prescriptive Path and Chapter 11: | | |
| <input type="checkbox"/> Attach COMcheck Report <input type="checkbox"/> Meet C402.3 Rooftop Solar Readiness* <input type="checkbox"/> Indicate C406 Option(s) Below | | |
| Section 406 (for ASHRAE compliance paths, one option must be C406.3) | | |
| <input type="checkbox"/> Two Options (Mass Save Territory) | | <input type="checkbox"/> One Option (non-Mass Save Territory) |
| <input type="checkbox"/> C406.2 More Efficient HVAC | <input type="checkbox"/> C406.3 Reduced LPD | <input type="checkbox"/> C406.4 Enhanced Lighting Controls |
| <input type="checkbox"/> C406.5 Renewable Energy | <input type="checkbox"/> C406.6 DOAS | <input type="checkbox"/> C406.7 High Efficiency SHW |
| For Chapter 11 and Appendix G: | | |
| Compliance report for permitting must include: | 1. A statement indicating that the proposed design complies with Chapter 11 or Appendix G | |
| | 2. A site-specific energy analysis report | |
| | 3. The name of the individual performing the analysis and generating the report | |
| | 4. The name and version of the compliance software tool | |

| | | |
|--|---|---|
| Compliance Path #2: IECC Prescriptive | | |
| <input type="checkbox"/> Attach COMcheck Report <input type="checkbox"/> Meet C402.3 Rooftop Solar Readiness* <input type="checkbox"/> Indicate C406 Option(s) Below | | |
| Section 406 | | |
| <input type="checkbox"/> Two Options (Mass Save Territory) | | <input type="checkbox"/> One Option (non-Mass Save Territory) |
| <input type="checkbox"/> C406.2 More Efficient HVAC | <input type="checkbox"/> C406.3 Reduced LPD | <input type="checkbox"/> C406.4 Enhanced Lighting Controls |
| <input type="checkbox"/> C406.5 Renewable Energy | <input type="checkbox"/> C406.6 DOAS | <input type="checkbox"/> C406.7 High Efficiency SHW |

*See Massachusetts amendments

Notes:

Project Address: _____ Project Name: _____

The above referenced project is being designed under the commercial provisions of (*Path of Compliance*):

- 2015 - IECC
- Prescriptive Performance

- ASHRAE 90.1 –2013
- Prescriptive Performance (Energy Cost Budget)

The following checklist is separated into *envelope, mechanical, lighting, additions and alterations*. Complete the appropriate checklists in their entirety, Indicate chosen compliance path and complete the Registered Design Professional in Responsible Charge section; sign and date, and provide stamp/seal/electronic signature as appropriate.

In accordance with DPS Energy Code Plan Submittal Guidelines, we have reviewed the design of this project for the following related provisions. It is our opinion that the items checked below, as designed, meet the substantial intent of the 2015 – IECC or ASHRAE 90.1 -2013. Code provisions not contained within the checklist will be provided to DPS for their review with the application submittal for a building permit.

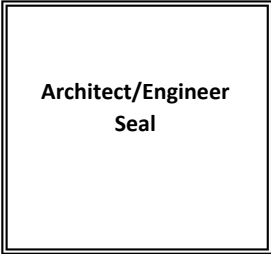
REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE – CONTACT INFORMATION

Individual/Company Name: _____

Address: _____

Email: _____ Phone: _____ Mobile: _____

Signature: _____ Print: _____ Date: _____



The *Commercial Design Checklist* must accompany all Commercial Building Permit Plan Submittals which are subject to the requirements of the International Energy Conservation Code (IECC) inclusive of all other documentation, forms, calculations, specifications and certifications.