Broward County Board of Rules and Appeals:
Energy Conservation Committee Meeting Agenda

October 2, 2023

1:00 PM

Zoom Meeting Information
https://broward-org.zoomgov.com/j/1612419064
Meeting ID: 161 241 9064

Roll Call

Approval of Minutes – July 26, 2023, Energy Conservation Committee

Chairman's Opening Remarks

Item #1: BORA Commercial Energy Guidelines (Performance) ……..…… (Dated 07-26-2023)

Item #2: BORA Residential Energy Guidelines (Performance) …… (Dated 07-26-2023)

General Discussion

Schedule the Next Meeting

Adjournment

Reference Documents for Committee Use

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.*

Energy Conservation Committee Meeting Minutes
July 26, 2023

BROWARD COUNTY
BOARD OF RULES AND APPEALS

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MEETING OF THE ENERGY CONSERVATION COMMITTEE

Minutes
July 26, 2023

Call to Order:

Chair David Rice, P.E., called a published meeting of the Broward County Board of Rules and Appeals Energy Conservation Committee to order at 1:40 PM.

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

Present:

Mike Charnin	Eric Jenison	Dennis Ulmer
Brock Donnelly	R. Art Kamm, P.E.	Bob Volin
Tim Fallon	David Rice, P.E.	
Wyatt T. Haygood	John Travers	

Staff: Timothy de Carion, Chief Energy Code Compliance Officer
Brianna Curry, Administrative Specialist
Ana Barbosa, Administrative Director

Guests: Daniel Lavrich, Board Chair
Rolando Soto, Chief Mechanical Code Compliance Officer

A motion was made by Mr. Charnin and seconded by Mr. Travers to approve the June 21, 2023, Energy Conservation Committee meeting minutes. The motion passed by unanimous vote.

Chair Rice shared that his goal for the meeting is to review the latest draft of the BORA Commercial Energy Guidelines (Performance). If the committee agrees on the changes, the revisions can be made and sent to the Board at the next scheduled Board meeting. If the guidelines are approved at the Board meeting, the Energy Conservation Committee will reconvene. The guidelines will be updated to be aligned with the 2023 Florida Building Code, Eighth Edition, which will be effective on December 31, 2023.

Item #1: BORA Commercial Energy Guidelines (Performance)

Mr. Timothy de Carion shared the most recent revisions to the BORA Commercial Energy Guidelines (Performance) document. He made the committee aware that the formatting of the guidelines is intended exclusively for performance

measures. The simplification of the guidelines was done in hopes of accommodating more than 90% of new commercial buildings that utilize the performance method of compliance for new buildings.

No one will be required to sign off on the calculations. The building official will be responsible for designating a member of their staff to be responsible for reviewing the energy code. Since the energy code cannot be changed, a system is being implemented to have all disciplines sign off rather than an individual.

Mr. de Carion began to cover the requirements for the Certificate of Occupancy for the Building Code Administrators Checklist (Performance Pathway Only). Mr. Bob Volin asked if everyone has to sign off on the form or if the form is intended to be used in-house. Mr. de Carion answered that it does serve as an in-house form, but the energy calculations need to be signed.

Mr. Mike Charnin shared that the plans are often digital.

Mr. Volin stated that since the Blower Door Testing is not mandatory, there is no standard in place for the process of designing a building. Mr. de Carion said that the criteria can be found in the structural checklist. Testing is required to verify that the air leakage rate is not greater than 0.40 cfm/ft^2.

Mr. Wyatt T. Haygood shared that an air barrier is necessary for roofing.

Dr. Ana Barbosa proposed formatting revisions for the guidelines document. She reinforced the importance of uniformity throughout the document.

Mr. de Carion and the committee members examined and revised the following sections: the Administrative Checklist (all disciplines), the BORA Structural Checklist (Performance Pathway Only), the BORA Mechanical Checklist (Performance Pathway Only), the BORA Electrical Checklist (Performance Pathway Only), and the BORA Plumbing Checklist (Performance Pathway Only).

Chair Rice reminded the committee that the energy guidelines will not replace the existing code. The guidelines are intended to assist with code interpretation. A better understanding of the code will result in more individuals following the code uniformly throughout Broward County.

A motion was made by Mr. Fallon and seconded by Mr. Volin to present the revised guidelines to the next scheduled Board meeting. The motion passed by unanimous vote.

A motion was made by Mr. Fallon and seconded by Mr. Haygood to adjourn 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 3:35 PM.

Item #1: BORA Commercial Energy Guidelines (Performance)
(Dated 07-26-2023)

Board of Rules and Appeals

Commercial Energy Guidelines

C401.2 (3): FBC Total Building Performance Compliance Option

Compliance with Sections C402.5, C403.2, C404, C405.2, C405.5, C407, and C408

Energy Conservation

Eighth Edition (2023)

Effective:

Table of Contents

Overview

To obtain uniform energy code enforcement in commercial buildings in Broward County, the Energy Conservation Committee has developed guidelines to aid jurisdictions in determining which discipline-specific plans examiner and inspector enforce certain sections of the Florida Building Code, Eighth Edition (2023) Energy Conservation. The following code sections regarding enforcement duties are as stated:

R103.3 & C103.3 Examination of documents.
The code official (plans examiner) shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

R103.3.1 & C103.3.1 Approval of construction documents.
When the code official (chief inspector or plans examiner) issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped, "reviewed for code compliance."

R104.1 & C104.1 General
Construction or work for which a permit is required shall be subject to inspection by the code official (inspector) or their designated agent, and such construction or work shall remain accessible and exposed for inspection purposes until approved.

The Basis for the Guidelines:
The Florida Building Code, Eighth Edition (2023) Energy Conservation for new and existing buildings has designated that the code official (building official) is responsible for both the construction document and construction inspection approval.

Unfortunately, the Florida Building Code Energy Conservation administrative chapters do not designate which discipline-specific plans examiner and inspector will review compliance documents and building plans and which inspector will enforce specific items for code compliance found in the Energy Conservation Code. Subsequently, uniformity needs to be improved in enforcing the energy code, which created confusion among code officials over which specific disciplines will enforce certain code provisions.

The building official or code official for energy code purposes shall be defined as the officer or other designated authority having jurisdiction charged with the administration and enforcement of this standard or a duly authorized representative. Broward County is unique in that we have individual certified plan review and inspection personnel for each discipline and that a multi-discipline code official is not the norm.

This guide can be used as a tool for the Building Official to determine which discipline-specific code official will review and inspect specific sections of the Energy Code for code compliance to address those issues. This guide shall not prevent any certified code official (plans examiner or inspector) from issuing a correction notice for any Energy Code deficiency found in another discipline if they notify the Chief Inspector of that discipline of the correction notice.

These guidelines are minimum checklists. The local AHJ may have additional checklist items.

Plan Review	**Code Section**
Scope and Administrative	**Chapter 1**
☐ **1.** The building official or designated agent shall verify that the Building Envelope, HVAC, Service Water Heating, Power, Lighting, and Other Equipment shown on the plans have been reviewed for energy code compliance and match the energy compliance report. The building official or their designated agent shall sign the code compliance report stating that the plans have been reviewed for all disciplines and will be inspected according to the Florida Building Code Energy Conservation. (The building department may use **Appendix A** as a compliance tool.)	C103.3 C103.3.1 CH-1 107.3 C101.5.1 FS 553.908
☐ **2.** The building official is authorized to accept inspection reports in whole or in part from either individual as defined in Section 553.993(5) or (7) of the Florida Statutes (energy auditor or energy rater) or third-party inspection agencies not affiliated with the building design or construction for energy code compliance.	C104.4

Certificate of Occupancy	**Chapter 1**
☐ **3.** Buildings that require commissioning according to Section C408.2 shall not be considered acceptable for final inspection pursuant to Section C104.2.6 until the code official has received a letter of transmittal from the building owner acknowledging that the building owner or owner's authorized agent has received the Preliminary Commissioning Report.	C408.2.4 C408.2.4.1 C104.2.6 CH-1 110.3.7.2
☐ **4.** When commissioning is required, the building official shall require a review of the Preliminary Commissioning Report to identify deficiencies found during testing that violate the code. (**Appendix E** may be used as a cover page to ensure a complete Preliminary Commissioning Report.)	C408.2.4.2
☐ **5.** The final commissioning report shall be provided to the owner and to the building department within 90 days of the date of receipt of the certificate of occupancy.	C408.2.5 C408.3.2

Administrative Checklist
All Disciplines

Plan Review	Code Section
Scope and Administrative	**Chapter 1**
☐ **1.** New commercial buildings shall comply with the Florida Building Code 8th Edition (2023) Energy Conservation. Additions to buildings shall be considered new construction.	C101.2 C502.1
☐ **2.** Construction documents shall indicate the energy compliance path selected from C401.2	C103.2
☐ **3.** Existing buildings shall be classified as exempt, except those defined as renovated buildings in which the total work exceeds 30% of the value of the structure. Buildings with a change of occupancy type or unconditioned buildings to which comfort cooling is added are not exempt. Buildings specified in Sections C101.4.2.1 thru C101.4.2.4 are exempt.	C101.4.2 C202 Renovated Building
☐ **4.** An existing building or portion thereof shall not be altered to become less energy efficient.	EBC701.2
☐ **5.** The complete energy compliance report shall be provided. Forms generated from computer software approved by the Florida Building Commission shall show *Pass* for all calculated disciplines.	C101.5.1
☐ **6.** The design professional responsible for the design of the building lighting, electrical, mechanical, plumbing systems, and the building shell shall certify compliance with the code by signing the energy code compliance form. **Note:** The signature date shall be dated after the plan date to ensure compliance with current plans.	C103.1.1.1.2
☐ **7.** The building official shall have the authority to approve a permit for part of the energy conservation system (such as a shell permit). Adequate information and detailed statements listing all code requirements must be submitted with this permit. The permit holder shall proceed at their own risk without assurance that the permit to complete will be granted. **Note:** All spaces inside a shell building shall be considered conditioned spaces at the time of construction, regardless of whether the a/c equipment is installed unless approved by the building official.	C103.3.3
☐ **8.** Changes to specified equipment made during the construction process that does not match the plans and energy compliance report shall be resubmitted and approved as amended.	C103.4
Commissioning	**C408**
☐ **9.** Plans shall indicate provisions for commissioning and completion requirements when required, according to Section C408.2.	C408
10. The preliminary commissioning report shall be reviewed by a code official before final inspection. The itemization of deficiencies found during testing shall be included in the report, and corrective measures used or proposed. (**Appendix E** cover page checklist may be used.)	C408.2.4 C408.2.4.2
☐ **11.** Construction documents shall have a note on the plans that the building owner or owners authorized agent shall receive within 90 days of the day of receipt of the certificate of occupancy of the following items: ☐ Equipment Drawings ☐ Maintenance Manuals ☐ Testing Report	C408.2.5 C408.2.5.3 C408.2.5.4
☐ **12.** The building shall not be occupied until documentation and verification of the installation and proper operation of all controls when commissioning is required. A letter signed by the owner or owner's representative acknowledging receipt of the Preliminary Commissioning report is required. (**Appendix E** cover page checklist may be used.)	C408 C104.2.6

BORA Structural Checklist
Performance Pathway Only

Plan Review	Code Section
Scope and Administrative	**Chapter 1**
☐ **1.** The administrative checklist on page #5 has been completed.	
☐ **2.** The plans shall show in detail all the pertinent energy data and features of the building, including but not limited to the following:	C103.2
☐ Insulation materials and their R-values. ***(S-1)***	
☐ Fenestration U-factor, solar heat gain coefficient (SHGC), and visible transmittance (VT) shall be shown. [**Appendix B** may be used for compliance. ***(S-2)***]	
☐ Air leakage sealing details.	
General Requirements	**Chapter 3**
☐ **3.** The U-factor, SHGC, VT, and air leakage rate for all manufactured fenestration products shall be determined by an accredited, independent laboratory and certified and labeled by the manufacturer or given default values in the tables. [See Appendix C ***(S-2)***.]	C303.1.3
Building Thermal Envelope	**C402**
☐ **4.** Low sloped roofs on new conditioned buildings in climate zone1 (Broward County) shall have a minimum tested solar roof reflectance and thermal emittance per Table C402.3	C303.1.5 C402.3
☐ **5.** Roof insulation (as part of the envelope) shall not be on a suspended ceiling with removable ceiling panels. (Insulation installed for sound and not part of the thermal envelope is allowed.)	C402.2.2
☐ **6.** The entire building thermal envelope shall be designed and constructed with a continuous air barrier and identified on the construction documents.	C103.2.1 C402.5.1
☐ **7.** Weather seals shall be installed on all loading dock/cargo doors to separate conditioned and unconditioned spaces. See Table C402.5.2	C402.5.4 C402.5.6
☐ **8.** Where unsealed or vented cavities occur over conditioned spaces, the ceiling shall be considered the pressure envelope of the building. Ceilings with drywall may be an air barrier but dropped acoustical tile ceilings may not. See the air barrier definition in C202.	C402.5.9
Total Building Performance	**C407**
☐ **9.** The roof or ceiling that functions as the thermal envelope shall be insulated to at least R-10. Multifamily residential roofs/ceilings shall be insulated to a minimum R-19, space permitting.	C407.2.1
☐ **10.** The code official (plans examiner) shall be permitted to require thermal zone diagrams consisting of floor plans showing each zone.	C407.4.2 (1)
☐ **11.** The input data report from the approved software shall be generated simultaneously with the compliance report to verify each entry into the software.	C407.4.2 (2)
☐ **12.** Building types and thermal blocks shall be accurately identified on the compliance report.	C407.5.2
Total Building Performance	**C407**
☐ **13.** The roof or ceiling that functions as the thermal envelope shall be insulated to at least R-10. Multifamily residential roofs/ceilings shall be insulated to a minimum R-19, space permitting.	C407.2.1
☐ **14.** The code official (plans examiner) shall be permitted to require thermal zone diagrams consisting of floor plans showing each zone.	C407.4.2 (1)
☐ **15.** The input data report from the approved software shall be generated simultaneously with the compliance report to verify each entry into the software.	C407.4.2 (2)
☐ **16.** Building types and thermal blocks shall be accurately identified on the compliance report.	C407.5.2

Structural Rough Inspection	**C104.2.2**
☐ **17.** A label shall be affixed to the window showing the tested U-Value, SHGC, and VT. Products lacking such a label shall be given the default values in Table C303.1.3. Installed vertical fenestration values shall be consistent with the specifications submitted with the plans. ***(S-1)***	C303.1.3
☐ **18.** Insulation shall be installed to the manufacturer's recommendations in a manner as to achieve the rated R-value. Insulation shall be labeled with R-value or a certificate providing R-value.	C303.2
☐ **19.** The entire building's thermal envelope shall be constructed with a continuous air barrier. Penetrations in the thermal envelope shall be sealed in an approved manner.	C402.5.1

Structural Final Inspection	C104.2.6
☐ **20.** The building envelope components and assemblies shall be inspected for air leakage, or the thermal envelope shall be tested. in accordance with Section C402.5.1.2.3	C402.5 C402.5.1.2.3

BORA Mechanical Checklist
Performance Pathway Only

Plan Review	Code Section
Scope and Administrative	**Chapter 1**
☐ **1.** The administrative checklist on page #5 has been completed.	
☐ **2.** The plans shall show in detail all the pertinent energy data and features of the building, including but not limited to the following:	C103.2
☐ Mechanical system design criteria	
☐ Equipment and system controls	
☐ Mechanical system and equipment types, sizes, and efficiencies	
☐ Economizer description	
☐ Fan motor horsepower (hp) and controls	
☐ Duct sealing, duct and pipe insulation, and location	
Building Mechanical Systems	**C403**
☐ **3.** Design heating and cooling loads shall be in accordance with ANSI/ASHRAE/ACCA Std. 183 or ACCA Manual N, or an approved equivalent. Design loads shall be attached to the code compliance form. A signed and sealed summary sheet designed by a licensed engineer may be submitted in lieu of the complete calculation but must show the required information.	C403.2.1
☐ **4.** The output capacity of the cooling and heating equipment shall not be greater than the loads calculated. The equipment selected shall be as small as possible within available equipment options. Stand-by (backup) equipment and duplicate sequenced load systems are exempt from this section. Living spaces in commercial buildings shall be sized using residential standards in accordance with Section R403.7.1.1 and exceptions.	C403.2.2
☐ **5.** HVAC equipment shall meet the minimum efficiency requirements and be verified through certification by an approved program or equivalent. (AHRI or Manufacturer)	C403.2.3
☐ **6.** Cooling towers shall meet the minimum performance requirements in tables.	C403.2.3
☐ **7.** Specific HVAC system controls shall be provided for temperature, setpoint overlap, off-hour controls, shutoff dampers, fan control, economizers, and VAV systems.	C403.2.4
☐ **8.** AMCA-500D tested, labeled, and approved motorized or gravity shutoff dampers shall be provided on outdoor air intakes and exhaust openings.	C403.2.4.3
☐ **9.** Group R-1 (Hotels) having over 50 guest rooms shall have controls (such as a card key system) to control temperature and ventilation in unoccupied rooms.	C403.2.4.8
☐ **10.** Demand control ventilation (DCV) (such as Carbon Dioxide monitors) is required in spaces over 500 sq. ft. and an average occupancy of 25 or greater per 1000 sq. ft. of floor area. See system requirements and exceptions.	C403.2.6.1
☐ **11.** Enclosed automobile parking garages shall have carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors to automatically reduce ventilation to at least 50% capacity or intermittently operate fans for 20% of the occupied time. Detection controls and alarms shall override reductions. Exhaust systems under 8000 cfm and power ratios exceeding 1125 cfm/hp are exempt.	C403.2.6.2
☐ **12.** Where the total exhaust of all kitchen hoods is greater than 5,000 cfm, each hood shall be a factory-built commercial exhaust hood listed in accordance with UL 710. One make-up air requirement option (like DCV) shall be selected. (*See exceptions*)	C403.2.8

☐	**13.** Duct insulation shall meet the minimum R-Value.	C403.2.9.1
☐	**14.** Space shall be provided adjacent to all mechanical components that form the air distribution system, including air handling units. (a minimum of (4) four inches is sufficient).	C403.2.9.3.3
☐	**15.** Cavities of a building shall not be used as a return air plenum unless the roof deck is insulated to a minimum of R-19. Roof insulation values shall be verified by the designer.	C403.2.9.4
☐	**16.** Ductwork shall be sized and designed with engineering standards. Sizing shall be room by room based on loads, static pressure, length, and friction loss. ACCA Manual-D or Equiv.	C403.2.9.5
☐	**17.** Air-Handling units shall not be allowed in attics as defined in commercial buildings. Air handlers must be located within the thermal envelope of the building and cannot be located immediately below an uninsulated roof. ***(M-1)***	C403.2.9.6
☐	**18.** Heating and cooling piping shall be insulated with values listed in Table C403.2.10 except where listed in this code section.	C403.2.10
☐	**19.** Low-capacity ventilation/exhaust fans less than 1/12 hp shall meet the efficiency requirements in Table C403.2.12.7. Intermittent hood and dryer fans are exempt.	C403.2.12.7
☐	**20.** Refrigeration systems shall meet the minimum performance requirements.	C403.2.14
☐	**21.** Heating and cooling controls shall be installed on operable openings to the outdoors that are larger than 40 square feet in area. *(See exceptions).*	C403.6 C402.5.11 C402.5.11.1
Total Building Performance		**C407**
☐	**22.** The input data report from the approved software shall be generated simultaneously with the compliance report to verify each entry into the software and match the plan.	C407.4.2 (2)
System Commissioning		**C408**
☐	**23.** Construction documents shall indicate provisions for commissioning and completion when the total cooling equipment capacity exceeds 480,000 Btu/h (40 tons). The HVAC units for dwelling units or sleeping units are to be excluded from the total Btu/h.	C408.2
☐	**24.** Construction documents shall require a written test and balance report to be provided to the owner or his representative for conditioned buildings with a total area exceeding 5,000 sq. ft. Buildings with cooling systems of 65,000 Btu/h or less per system are exempt from these requirements. (*See building definition*) ***(M-2)***	C408.2.2
☐	**25.** Total building envelope pressurization shall be either neutral or positive to prevent excess infiltration of latent load. The kitchen hood exhaust shall be sized to prevent excessive depressurization. An air balance schedule totaling all airflow is needed to show compliance.	C408.2.2.1
Mechanical Rough Inspection		**C104.2.4**
☐	**26.** Duct and piping insulation shall be installed according to the manufacturer's instructions.	C303.2
☐	**27.** Duct insulation shall meet the minimum R-Value specified. (*See exceptions*).	C403.2.9.1.1

Mechanical Rough Inspection	**C104.2.4**
28. Duct insulation shall be protected from damage and be sealed. Additional insulation shall be provided when the minimum insulation is insufficient to prevent condensation. ***(M-3)***	C403.2.9.1.2
29. High-pressure duct systems designed to operate at pressures greater than 3-inch water gauge (4-inch water gauge pressure class) shall be tested for leakage per Table C403.2.9.2	C403.2.9.2
30. All ducts and building cavities in the air distribution system shall be sealed.	C403.2.9.3
31. All air distribution system components shall be mechanically fastened to secure the sections in addition to a seal. A clinching strap used on flex duct systems is not a sealing method.	C403.2.9.3.1 C403.2.9.3.6
32. Terminal fittings (such as boot cans) and intermediate fittings shall be sealed with an approved closure system to provide an air barrier. Closure systems shall use the manufacturer's instructions or industry installation standards where more restrictive.	C403.2.9.3 C403.2.9.3.2 C403.2.9.3.4
33. Air distribution systems and hydronic systems shall have means to balance air and water systems to NEBB, AABC, or equivalent standards. Buildings with cooling systems of 65,000 Btu/h or less per system are exempt. (*See building definition*) ***(M-2)***	C408.2.2.1 C408.2.2.2
Mechanical Final Inspection	**C104.2.4**
34. Equipment model numbers and efficiency ratings of HVAC equipment shall be verified thru certification under an approved certification program. (AHRI) or equivalent.	C403.2.3
35. Motorized or gravity shutoff dampers shall be installed on outdoor air intakes and exhaust openings. Dampers shall close when the system or space is not in use. ***(M-4)***.	C403.2.4.3
36. Mechanical closets/equipment rooms shall be sealed. All penetrations shall be sealed with an approved closure system. Wall and ceiling passageways shall be framed and sealed.	C403.2.9.2
37. Insulation exposed to weather shall be protected from damage by sunlight, moisture maintenance, and wind. Adhesive tape shall not be used on pipe insulation.	C403.2.9.1.2 C403.2.10.1
38. Refrigeration systems, commercial refrigerators/freezers, and walk-in coolers/freezers shall meet the performance requirements in Tables C403.2.14.1(1) thru C403.2.12.2(3).	C403.2.14
System Commissioning	**C408**
39. Systems serving zones exceeding 5000 sq. ft. shall have the air distribution system tested, adjusted, and balanced by a licensed engineer, company, or individual holding a current certification from a recognized testing and balancing agency. Buildings with cooling systems of 15 tons or less per system may be tested and balanced by the mechanical contractor.	C408.2.2
40. Air distribution systems shall be tested, adjusted, and balanced to be within 10% or less as specified by the designer of record per NEBB, AABC, or equivalent procedures.	C408.2.2.1
41. Hydronic systems shall have the means to balance and shall be balanced for pumps (>5 hp).	C408.2.2.2
42. Functional performance testing of equipment and controls shall be witnessed by a licensed design professional, electrical engineer, mechanical engineer or approved agency. The reporting commissioning professional shall be present for any functional performance tests being conducted.	C408.2.3
43. Access to air-balancing dampers and hydronic balancing valves shall be provided.	M306.1

BORA Electrical Checklist
Performance Pathway Only

Plan Review	Code Section
Scope and Administrative	**Chapter 1**
☐ **1.** The administrative checklist on page #5 has been completed.	
☐ **2.** The plans shall show in detail all the pertinent energy data and features of the building, including but not limited to the following:	C103.2
☐ Lighting fixture schedule with wattage	
☐ Control Narrative	
☐ Location of daylight zones on floor plans	
☐ Efficiency of installed ceiling fans and electrical equipment	
Building Envelope Requirements	**C402**
Air Leakage	**C402.5**
☐ **3.** Air barriers shall be maintained and sealed for all light fixtures and other electrical equipment, electrical and communication boxes, conduits, cables, etc., when they penetrate the thermal envelope.	C402.5.1.1(4) C402.5.1.1 (5)
☐ **4.** Recessed lighting installed in the thermal envelope shall be:	C402.5.8
☐ IC Rated ☐ Labeled <2.0 CFM leakage ☐ Sealed with a gasket or caulk per manufacturer	
Building Mechanical Systems	C403
☐ **5.** Large-diameter ceiling fans shall be tested and labeled with AMCA230 and meet the efficiency requirements in Table C403.2.12.6 and Section C403.2.12.6.1	C402.5.8
Electrical Power and Lighting Systems	**C405**
☐ **6.** Lighting for dwelling units in multifamily buildings shall comply with residential Section R404.1. (Percentage and efficacy requirements)	C405.1
☐ **7.** Walk-in coolers shall have lighting with an efficacy of not less than 40 lumens per watt and have a vacancy sensor.	C405.1.1
Lighting Controls	
☐ **8.** The lighting control narrative shall be shown on the plans. The design professional, not the plan reviewer, shall declare one of the two compliance options of lighting control specified in Section C405.2(1) or C405.2(2).	C405.2
☐ **9.** The light fixtures shall be compatible with the control devices.	C303.2
Occupant Sensor Controls	
☐ **10.** The floor plans shall show the location of each occupancy sensor in the following areas:	C405.2.1
☐ Conf./Mtg. ☐ Copy/Print ☐ Lounges/Break ☐ Enclosed Offices	
☐ Open-Plan Offices ☐ Restrooms ☐ Storage ☐ Locker	
☐ Warehouse Storage ☐ Corridors (see #13) ☐ Classroom ☐ Enclosed Spaces <300 sq. ft.	
☐ **11.** Warehouses shall have occupant sensors in each aisleway and separately in open areas.	C405.2.1.2

☐	**12.** Open-plan office areas greater than 300 sq. ft. shall have separate control zones not greater than 600 sq. ft.	C405.2.1.3
☐	**13.** Corridor lighting with occupancy sensors shall reduce lighting to 50% power after 20 minutes. *(See exceptions)*	C405.2.1.4
Time Switch Controls		
☐	**14.** Each area not provided with occupancy sensor controls mentioned in C405.2.1 shall have a time switch controls and manual controls. *(See exceptions).*	C405.2.2
Light Reduction Controls		
☐	**15.** General lighting shall have manual light reduction controls and are required in spaces without occupancy sensor controls as specified in accordance with C405.2.3.1 (*See exceptions*)	C405.2.3
Daylight Responsive Controls		
☐	**16.** Daylight responsive controls shall be provided to control general lighting within shown daylight zones when lighting in those zones exceed 150 watts. *(See exceptions)*	C405.2.4
Special Application Controls		**Code Section**
☐	**17.** Specific application lighting shall have separate manual controls and be provided with an occupancy sensor or time switch controls for the following:	C405.2.5(1)

☐ Display/Accent ☐ Display Cases ☐ Task ☐ Lighting for Sale

☐ Exhibits

☐	**18.** Sleeping units in hotels shall have a control device (such as a card key system) to turn off lights and switch receptacles within 20 minutes after all occupants have left.	C405.2.5(2)
Exterior Lighting Controls		**C405.2.7**
☐	**19.** Exterior lighting shall have daylight shutoff controls. *(See exceptions)*	C405.2.7.1
☐	**20.** Building facade and landscape lighting shall have automatic shutoff.	C405.2.7.2
☐	**21.** Parking garage lighting shall have occupancy sensors or time switch controls *(See exceptions)*	C405.2.8
Exterior Lighting Power Requirements		**C405.4**
☐	**22.** Total connected exterior lighting power shall be calculated using Tables C405 .4.2 (1) & (2) from the software, and all lighting calculated on the input data report shall match the plans.	C405.4.1
Electric Power		**C405.5**
☐	**23.** Commercial buildings with individual dwelling units shall have each unit separately metered.	C405.5.2
☐	**24.** Conductors for feeders and branch circuits combined shall be sized for a maximum of 5% voltage drop total.	C405.5.3
☐	**25.** Construction documents shall have a note to require the building owner to receive the following:	C405.5.4.1 C405.5.4.2

☐ Record drawings within 30 days ☐ Manuals

☐	**26.** Dry-type distribution transformers shall comply with C404.6	C405.6
☐	**27.** Electric motors shall comply with C405.7	C405.7
☐	**28.** Vertical and horizontal transportation systems and equipment shall comply with C405.8.	C405.8

Total Building Performance	**C407**
☐ **29.** Compliance Report (Energy Calculations Software) shall be provided, and the input report shall list all the interior and exterior lighting for calculations to match the plans.	C407.4.1 C407.6.2
Electrical Rough Inspection	**C104.2.5**
☐ **30.** The inspection shall verify that the installed lighting systems, components, controls, and meters comply with the Energy Code and the approved plans.	C104.2.5
☐ **31.** When penetrating the thermal envelope, air barriers shall be maintained and sealed for all light fixtures and other electrical equipment, conduits, cables, etc.	C402.5.1
☐ **32.** Electrical and Communication boxes that penetrate the air barrier of the building thermal envelope, and that do not comply with C402.5.10.1, shall be caulked, taped, gasketed, or otherwise sealed to the air barrier element being penetrated. All openings on the concealed portion of the box shall be sealed. Where present, insulation shall rest against all concealed portions of the box. Where air-sealed boxes are installed, they shall be marked in accordance with NEMA OS 4. Air-sealed boxes shall be installed in accordance with the manufacturer's instructions	C402.5.10 C402.5.10.1
Electrical Final Inspection	**C104.2.6**
☐ **33.** Air barriers shall be maintained and sealed for all light fixtures and other electrical equipment, junction boxes, conduits, cables, etc., when they penetrate the thermal envelope.	C402.5.1
Maintenance Information and System Commissioning:	**C408**
☐ **34.** Prior to passing the final inspection, the licensed design professional or approved agency shall provide evidence that the lighting control system has been tested and working per the plans and manufacturer's instructions. The report shall include the results and contain a list of the disposition of deficiencies found and corrective measures proposed. (**Appendix E** may be used) **Note:** The plans may require that the contractor provide written evidence that lighting control systems have been tested by either the electrical contractor, the lighting fixture manufacturer's representative, or the control system representative.	C408.3 C408.3.1 C408.3.2
☐ **35.** Building operation and maintenance documents shall be provided to the owner for all electrical power, lighting control systems, etc., as per C408.1. (**Appendix E** may be used)	C408.1 C408.3.2.2

BORA Plumbing Checklist

Performance Pathway Only

Plan Review	Code Section
Scope and Administrative	**Chapter 1**
☐ **1.** The administrative checklist on page #5 has been completed.	
☐ **2.** The plans shall show in detail all the pertinent energy data and features of the building, including but not limited to the following:	C103.2
☐ Insulation materials and their R-Values	
☐ Service water heating system and equipment types, sizes, and efficiencies	
☐ Equipment and system controls	
Definitions	**Chapter 2**
Circulating Hot Water System: A hot water distribution system where pumps are used to circulate heated water from the water-heating equipment to the fixture and back. (System has a dedicated return pipe)	C202
Demand Recirculating System: A hot water distribution system where pumps prime the hot water supply piping with heated water upon demand for hot water. (Uses cold-water supply pipe to prime hot water pipe)	C202
Service Water Heating	C404
☐ **3.** Water-heating equipment and hot water tanks shall meet the minimum efficiency requirements of Table C404.2 and be verified through either data from the manufacturer or by an approved program (AHRI or equivalent.)	C404.2
☐ **4.** All supply and return recirculating hot water piping shall be insulated with the required thickness in Table C403.2.10. The first 8 feet of branch piping shall be insulated.	C404.4
☐ **5.** Heated water supply piping shall be limited in length or water volume according to Table C404.5.1. When maximum lengths differ from plumbing code, the more stringent applies.	C404.5 CH-1-102.1
☐ **6.** Heated water circulating systems shall have accessible controls, sensors, and pumps. Manual controls shall be readily accessible without requiring the removal of any obstruction.	C404.6
☐ **7.** Heated Water Circulation Systems shall have controls that start the pump based on a demand for hot water. The controls shall also turn off the pump when the hot water temperature is at the desired temperature and there is no demand for hot water.	C404.6.1
☐ **8.** Demand Circulation Systems shall have controls with one of the following:	C404.7
☐ Start the pump upon receiving a signal from the user of a fixture.	
☐ Start the pump with a device sensing the presence of the user.	
☐ Start the pump with a device that senses the presence of flow to a fixture or appliance.	
☐ A separate control is also required to limit the water entering the cold-water supply to 104°.	
Total Building Performance	**C407**
☐ **9.** The input data report from the approved software shall be generated simultaneously with the compliance report to verify each service water heating entry into the software.	C407.4.2.2
Plumbing Rough Inspection	**C104.2.3**
☐ **10.** The rough inspection shall verify the type and R-value of the pipe insulation.	C404
☐ **11.** Heated water supply piping shall comply with length (C404.5.1) or water volume (C404.5.2).	C404
Plumbing Rough Inspection	**C104.2.3**
☐ **12.** Water heating equipment model numbers shall match the approved plans.	C404.2
☐ **13.** Required pipe insulation and insulation protection shall be installed.	C404.4
☐ **14.** Required hot water pump controls shall be installed and accessible.	C404.6
Maintenance Information and System Commissioning	**C408**
☐ **15.** The Service Water Heating Control System shall be tested so that controls, components, equipment, and systems are calibrated, adjusted, and working according to plans and specs.	C408.2.3.2

APPENDIX A

Commercial Energy Code Compliance Review Form

PERMIT # _____ ADDRESS _____

A review of the plans and specifications covered by this compliance report indicates compliance with the

_____ *Florida Energy Conservation Code.*

DISCIPLINE	**NAME**	**SIGNATURE**	**DATE**
STRUCTURAL			
MECHANICAL			
PLUMBING			
ELECTRICAL			

APPENDIX B

Commercial Fenestration Product Rating Submittal Form

In accordance with the Florida Energy Conservation Code C303.1.3, this form can be used as a tool for the submittal process to document the proposed energy product rating for windows, doors, and skylights.

Recommended for Review:

- Copy the approved input report from the Energy Calculations showing each fenestration design rating (U-value, SHGC, and VT) for all fenestration in the building.
- A list of the NFRC Certified Product Directory number of each window showing the U-Value, SHGC, and VT on the attached form. These numbers may be found on the NFRC website: https://search.nfrc.org/search/searchDefault.aspx.

Window Number	**NFRC Directory Number*	*Description*	*U-Value*	*SHGC*	*VT*
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					

Window Number	**NFRC Directory Number*	*Description*	*U-Value*	*SHGC*	*VT*
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
31					
33					
34					
35					
36					
37					
38					

Notes:

- Products not listed in the NFRC directory shall be tested by an accredited, independent laboratory in accordance with FBCEC C303.1.3. Products not tested and lacking certification and labeling shall be assigned a default rating from the energy tables.
- Products submitted that do not match the approved Energy Calculations shall require a revised energy compliance report or window submittal per FBCEC C103.4.
- *Products not tested and labeled use the default tables in C303.1.3.

Appendix C

TABLE C303.1.3(1)
DEFAULT GLAZED FENESTRATION U-FACTORS

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT	
			SINGLE	DOUBLE
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

TABLE C303.1.3.(2)
DEFAULT OPAQUE DOOR U-FACTORS

DOOR TYPE	U-FACTOR
Uninsulated Metal	1.20
Insulated Metal (Rolling)	0.90
Insulated Metal (Other)	0.60
Wood (Other	0.50
Insulated, nonmetal edge, max 45% glazing. Any glazing double pane	0.35

TABLE C303.1.3 (3)
DEFAULT WINDOW, GLASS DOOR, AND SKYLIGHT SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	CLEAR	TINTED	CLEAR	TINTED	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

Appendix D

Structural Notes

S-1. The plans shall specify what type and R-value of insulation will be installed. It is not acceptable to have comments on the plan details that indicate: "*See energy calculations*." Baffles are required for blown-in insulation to keep the vents from becoming blocked upon installation and drift.

S-2. Windows must be tested for energy efficiency if the compliance report does not use default values in Table C303.1.3. U-factors shall be determined in accordance with standard NFRC 100. The VT and the SHGC (Solar Heat Gain Coefficient) shall be determined in accordance with standard NFRC 200. Testing must be done by an accredited independent laboratory and then labeled and certified by the manufacturer. NFRC standards require both computer simulation and physical test results to be validated by an independent agency (IA). Energy values validated by an independent agency (IA) shall match the product's label per Florida Building Code Energy Conservation C303.1.3.

NFRC National Fenestration Rating Council® CERTIFIED	**World's Best Window Co.** Series "2000" Casement Vinyl Clad Wood Frame Double Glazing•Argon Fill•Low E XYZ-X-1-00001-00001
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S. / I-P) **0.35**	Solar Heat Gain Coefficient **0.32**
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance **0.51**	Air Leakage (U.S. / I-P) **≤0.3**
Condensation Resistance **51**	**–**

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org

Mechanical Notes

M-1. The air inside the attic can reach temperatures of over 150 degrees, far hotter than it gets outdoors. Air handler cabinets are typically insulated with R-4.2 insulation below the minimum outdoor ductwork requirements. Condensation problems are common on air handlers due to South Florida's humidity. Locating the air handlers outside the thermal envelope wastes energy and is prohibited by this section. The minimum envelope roof/ceiling insulation using the performance method of compliance is R-19 for multifamily buildings and R-10 for all other commercial buildings.

M-2. A building containing multiple tenants and occupancy types with firewalls between them may be considered multiple buildings for energy code analysis during phased construction. If each tenant has its air conditioning system divided by firewalls, that tenant may be considered one building and have its energy compliance report. Each building or tenant may be evaluated separately for energy code compliance. For example, an individual tenant in a shopping/strip mall exceeding 5000 sq. ft. shall be required to have a test and balance report of the air distribution system unless that tenant has units 65,000 or less. This requirement does not exempt systems from balancing requirements if requested by the designer of record.

M-3. Outside air ducts passing thru conditioned space have the potential to sweat and condensate inside the duct due to humid conditions in Florida. The design professional should know this potential problem to prevent moisture damage to ceilings.

M-4. Failure to install and test the operation of the outside air and exhaust shutoff dampers can increase the latent load of the building, increase energy use, and affect comfort in conditioned spaces. Dampers are not required for ventilation or exhaust of unconditioned spaces or Type 1 kitchen hood exhausts.

Appendix E

Commissioning Compliance Checklist

Project Information: _____

Project Name: _____

Project Address: _____

Commissioning Authority: _____

Commissioning Plan (Section C408.2.1)

☐ The commissioning plan was used during construction and included all items required by Section C408.2.1.

☐ Systems adjusting and balancing have been completed.

☐ HVAC Equipment functional testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on: _____

☐ HVAC Controls functional testing has been executed. If applicable, deferred and follow-up testing is to be provided on: _____

☐ Economizer functional testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on: _____

☐ Lighting Controls functional testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on: _____

☐ Service Water Heating System functional testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on: _____

☐ Manual, record documents, and training have been completed or scheduled.

☐ Preliminary Commissioning Report submitted to the owner and included the itemization of deficiencies not corrected.

I certify that the commissioning provider has provided me with evidence of mechanical, service water heating, and lighting systems commissioning in accordance with the Florida Building Code, Seventh Edition (2020) Energy Conservation.

Signature of Building Owner
or Owner's Representative _____ Date _____

Item #2: BORA Residential Energy Guidelines (Performance)
(Dated 07-26-2023)

Board of Rules and Appeals

Residential Energy Guidelines

R401.2 (2): FBCEC Total Building Performance Compliance Option
Compliance with Section C405 and the provisions of
Sections R401 through R404 Labeled "Mandatory"

Energy Conservation

Eighth Edition (2023)

Effective: _____

Table of Contents

Overview

To obtain uniform energy code enforcement in commercial buildings in Broward County, the Energy Conservation Committee has developed guidelines to aid jurisdictions in determining which discipline-specific plans examiner and inspector enforce certain sections of the Florida Building Code, Eighth Edition (2023) Energy Conservation.
The following code sections regarding enforcement duties are as stated:

R103.3 & C103.3 Examination of documents.
The code official (plans examiner) shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

R103.3.1 & C103.3.1 Approval of construction documents.
When the code official (chief inspector or plans examiner) issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped "reviewed for code compliance."

R104.1 & C104.1 General
Construction or work for which a permit is required shall be subject to inspection by the code official (inspector) or their designated agent, and such construction or work shall remain accessible and exposed for inspection purposes until approved.

The Basis for the Guidelines:
The Florida Building Code, Eighth Edition (2023) Energy Conservation for new and existing buildings has designated that the code official (building official) is responsible for both the construction document and construction inspection approval.

Unfortunately, the Florida Building Code Energy Conservation administrative chapters do not designate which discipline-specific plans examiner and inspector will review compliance documents and building plans and which inspector will enforce specific items for code compliance found in the Energy Conservation Code. Subsequently, uniformity needs to be improved in enforcing the energy code, which created confusion among code officials over which specific disciplines will enforce certain code provisions.

The building official or code official for energy code purposes shall be defined as the officer or other designated authority having jurisdiction charged with the administration and enforcement of this standard or a duly authorized representative. Broward County is unique in that we have individual certified plan review and inspection personnel for each discipline and that a multi-discipline code official is not the norm.

This guide can be used as a tool for the Building Official to determine which discipline-specific code official will review and inspect specific sections of the Energy Code for code compliance to address those issues. This guide shall not prevent any certified code official (plans examiner or inspector) from issuing a correction notice for any Energy Code deficiency found in another discipline if they notify the Chief Inspector of that discipline of the correction notice.

These guidelines are minimum checklists. The local AHJ may have additional checklist items.

Plan Review	**Code Section**
Scope and Administrative	**Chapter 1**
☐ **1.** The building official shall appoint a plans examiner to verify that all disciplines have reviewed the plans and the code compliance report for energy code compliance. The plans examiner shall sign the code compliance report stating that the plans have been reviewed by all disciplines and the plans will be inspected according to the FECC. The building department may use Appendix C as a compliance tool.	R103.3 R103.3.1 FS 553.908
Reporting Schedule	
☐ **2.** A reporting form shall be submitted to the local building department by the owner or owner's agent with the submittal certifying compliance with this code. Reporting forms shall be a copy of the front page of the compliance form applicable for the code chapter under which compliance is demonstrated (R405-2023). It shall be the responsibility of the local building official to forward the reporting section of the proper form to the entity representing the Florida Building Commission on a quarterly basis. **Mail reporting form to:** M. E. Rinker, Sr. School of Construction Management University of Florida PO Box 115703 304 Rinker, Third Floor Gainesville, FL 32611-5703 USA **OR** **Upload Forms to:** https://coremng.dcp.ufl.edu/epi/ Note: Scan in format 300dpi or smaller.	R103.1.1.2.1 R103.1.1.2.1.1
Certificate of Occupancy	**Chapter 1**
☐ **3.** The building official shall require that an energy performance level (EPL) display card be completed and signed by the building qualifier that it is accurate and correct before final approval for the building for occupancy. Florida law (Section 553.9085, Florida Statutes) requires the EPL display card to be included as an addendum to each sales contract for both presold and non-presold residential buildings.	R401.3 R405.4.3 (1)

Administrative Checklist

All Disciplines

Plan Review	Code Section
Scope and Administrative	**Chapter 1**
☐ **1.** New residential buildings shall comply with the Florida Building Code 8th Edition (2023) Energy Conservation. Additions to buildings shall be considered new construction.	R101.2 R502
☐ **2.** Buildings defined as residential, which are three stories and less in height, shall comply with the residential energy code. Mixed-use buildings shall submit separate compliance reports	R101.5.1.2 R101.4.1
☐ **3.** Existing buildings shall be classified as exempt, except those defined as renovated buildings in which the total work exceeds 30% of the value of the structure. Buildings with a change of occupancy type or unconditioned buildings to which comfort cooling is added are not exempt. Buildings specified in Sections R101.4.2.1 through R101.4.2.4 are exempt.	R101.4.2
☐ **4.** An existing building or portion thereof shall not be altered to become less energy-efficient	EBC701.2
☐ **5.** The complete energy compliance report shall be provided. Forms generated from computer software approved by the Florida Building Commission shall show *Pass.*	R101.5.1
☐ **6.** The building's owner, or architect, or owner/agent shall certify compliance with the Florida Energy Conservation Code by signing the prepared compliance report.	C103.1.1.2
☐ **7.** Any changes that affect the energy efficiency of the building shall require revised plans and a revised energy compliance report.	C103.4
Performance Alternative	**R405**
☐ **8.** The energy compliance report shall match the plans and shall comply with the following:	R405.4.2
☐ The building street address and climate zone #1 shall be selected for Broward County from Table R301.1.	
☐ The name of the person who prepared the report and a signature are required to certify that the proposed design complies with the energy code.	
☐ The compliance report code version shall match the plans.	

BORA Structural Checklist
Performance Pathway Only

Plan Review	**Code Section**
Scope and Administrative	**Chapter 1**
☐ **1.** The administrative checklist on page #5 has been completed.	
☐ **2.** The energy compliance report shall match the plans and shall comply with the following:	R405.4.2
☐ The number of bedrooms shall be shown. (Item 4)	R405.4.2
☐ The solar heat gain coefficient (SHGC) of the windows. (Item 7)	
☐ The R-values of the floor above the garage and any entry area ceiling in a two-story home shall be shown separately. (Item 9)	
☐ Insulation R-values and areas of exterior walls, adjacent walls, and ceilings. (Item10 & 11)	
☐ The R-value and area of knee walls adjacent to the attic. (Item 11b)	
☐ Reports that claim a cool roof option shall provide documentation of testing. (Notes)	R405.7.2
☐ **3.** The following information shall be submitted and shown on the plans	R103.2
☐ The building's thermal envelope shall be shown.	R103.2.1
☐ Air Barrier sealing details and materials used shall be shown.	R103.2(8)
☐ Window schedules shall include the "NFRC tested" U-factors and SHGC values. **Note:** Submittals may use Appendix A, *Residential Fenestration Submittal Form* (S-1)	R103.2(2)
☐ Wall sections shall show the ceiling and wall insulation and shall show design R-values.	R405.4.3(2)
☐ The conditioned floor area shall be shown on the architectural plans.	R103.2(1)
Rough Inspection	**R104.2.2**
☐ **1.** A continuous air barrier shall be installed in the exterior building's thermal envelope.	R402.4.1.1
☐ **2.** Windows and door jambs, framing, and skylights shall be sealed.	Table R402.4.1.1
☐ **3.** Ceiling and wall insulation R-Values shall match the plans. Manufacturer's instructions shall be followed, and attic vents shall not be blocked. (S-2)	R104.2.2 R303.2
☐ **4.** A label shall be affixed to the window showing the tested U-Value and SHGC. These values shall match the values shown on the plans. (S-1)	R104.2.2 R303.1.3
Final Inspection	
☐ **1.** All installed attic insulation shall have an insulation certificate posted at or near the attic's opening and an insulation certificate shall be submitted to the AHJ.	R303.1.1.1 R303.1.1.2
☐ **2.** Blown or sprayed insulation shall be installed per inch according to plans. Blown insulation thickness shall be verified with markers installed every 300 sq. ft. Attic vents shall not be blocked.	R303.1.1.2.1 R402.2.3 R402.4
☐ **3.** Access-openings, drop-down stairs, or knee wall doors to unconditioned attic spaces shall be sealed and baffled to maintain blown insulation. The attic hatch shall be insulated.	R402.2.4
☐ **4.** Air sealing shall be provided for the interior garage door and the walls that separate conditioned spaces from the garage area.	Table R402.4.1.1
☐ **5.** Windows and door jambs, framing, and skylights shall be sealed on the exterior fame.	Table R402.4.1.1
☐ **6.** Mechanical closets shall be sealed to prevent leakage.	R403.3.2 C403.2.9.2

BORA Mechanical Checklist
Performance Pathway Only

Plan Review	Code Section
Scope and Administrative	**Chapter 1**
☐ **1.** The administrative checklist on page #5 has been completed.	
☐ **2.** The energy compliance report shall match the plans and shall comply with the following:	R405.4.2
☐ The site plan showing actual home orientation shall be shown. Worst-case orientations shall be accepted. HVAC load calculations shall be site-specific. (Item 5)	
☐ Window areas shall be shown. Sliding glass doors and opaque doors with glazing equal to or over 30% of the total area shall be included in the windows section. (Item 7)	
☐ Overhang effect shall be shown. (Item 7) **(M-2)**	R405.5.3
☐ Ceiling areas and insulation values shall be shown. Knee walls shall be shown separately as ceiling area. **(M-1)**	R405.5.3.2
☐ The R-value of ducts, surface area, and the location of the ductwork shall be shown.	
☐ Ductwork classified as "leak-free" requires a duct leakage test report and shall be required for the final inspection. (Item 12)	R405.2 R405.2.3
☐ The number of A/C systems, each system's efficiency rating, and the equipment's size shall be shown. (Item 13) **(M-5)**	R103.2 (5)
☐ The heater type, size, and fuel source shall be shown. (Item 14)	
☐ Energy credits shall be shown. (Item 16) **(M-3)**	R405.7
☐ **3.** The following information shall be submitted and shown on the plans	
☐ The cooling and heating load calculations shall be submitted with the mechanical plans.	R403.7.1
☐ The cooling equipment design capacity shall not exceed 1.15 times greater than the total calculated load. See exceptions	R403.7.1.1
☐ Strip heaters shall be sized within 4 kW of the design requirements.	R403.7.1.2.2
☐ Mechanical design criteria and controls (T-stat) shall be shown.	R103.2 (4)
☐ Duct sealing methods, duct and pipe insulation values, and duct locations shall be shown.	R103.2 (7)
☐ Outdoor air intakes and exhausts shall have automatic or gravity dampers and shall be shown.	R403.6
☐ Replacement outdoor combustion air and tight-fitting flue dampers or doors for wood-burning fireplaces shall be shown.	R402.4.2
Rough Inspection	R104.2.4
☐ **1.** Building framing cavities shall not be used as ducts or plenums.	R403.3.5
☐ **2.** Air-handling units may only be installed in the attic if all code exceptions are met. **Note:** The service panel of the equipment shall be located within 6 feet of an attic access.	R403.3.6
☐ **3.** All supply and return ducts not completely inside the *building thermal envelope* shall be insulated to a minimum of R-6. Site-wrapped supply ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-8.	R405.2
☐ **4.** Suction line refrigerant piping shall be a minimum of R-3.	R403.4

Rough Inspection	R104.2.4
☐ **5.** All ducts shall be mechanically attached. The reinforced core on flex ducts shall be mechanically attached to the duct fitting by a draw-band.	R403.3.2 C403.2.9.3.6
☐ **6.** All ducts shall be sealed. The reinforced lining on the flex duct shall be sealed, and the duct collar flange shall be sealed to the duct board using tape, mastic, or gasket. Note: A draw band is not a seal and is only a mechanical attachment. **(M-4)**	R403.3.2 C403.2.9.3.2
☐ **7.** The flexible duct's outer jacket (Vapor Barrier) shall be sealed to prevent condensation.	R403.3.2
☐ **8.** Sufficient space shall be given to install the required ceiling and wall insulation	R402.4.1.1
☐ **9.** Combustion air ducts shall be installed for wood-burning fireplaces.	R402.4.2
Final Inspection	**R104.2.5**
☐ **1.** The envelope leakage test report shall be provided to the code official. The report shall be reviewed for ventilation compliance by the mechanical department and approved before a final mechanical inspection is approved.	R402.4.1.2
☐ **2.** HVAC registers penetrating the thermal envelope shall be sealed to the drywall. Penetrations shall be caulked, gasketed, or otherwise sealed in a manner compatible with the construction materials and location.	R402.4.1.1
☐ **3.** Sufficient space (about 4 inches) shall be provided adjacent to all mechanical components of the air distribution system to assure room for inspection, seal, and maintenance.	R403.3.2 C403.2.9.3.3
☐ **4.** The efficiency rating of each system shall be verified by providing certification through an approved certification program, such as (AHRI), matching the corresponding model numbers shown on the plans. **(M-5)**	R405.4.3 (2) R303.1.2
☐ **5.** Mechanical closets and enclosed support platforms shall be sealed to prevent leakage.	R403.3.2
☐ **6.** Piping insulation exposed to weather shall be protected from damage.	R403.4.1
☐ **7.** Tight-fitting flue dampers or tight-fitting doors shall be installed for wood-burning fireplaces.	R402.4.2
☐ **8.** A duct leakage test report shall be submitted when an air leakage rate other than the default leakage rate at .08 (8%) is selected on the compliance report	R405.2.3 R403.3.3

BORA Envelope Leakage Test Report Checklist

All Disciplines

	Report Review	Code Section
☐	**1.** The envelope leakage test shall be completed before the final inspection.	R402.4.1.2
☐	**2.** The envelope leakage test report form from the approved software, submitted with the application for a permit, shall be used to show compliance with the code. **(TR-1)**	R101.5.1
☐	**3.** The envelope leakage test report shall have the address and permit number on the report and be completed and signed by a qualified tester.	R101.5.1 R402.4.1.2
☐	**4.** The method of compliance shall be indicated on the form and match the method selected when the building permit was issued. **(TR-2)**	R405.2.2 R401.2
☐	**5.** The air change design rate shall be indicated in the box provided on the test report when using the performance method. **(TR-3)**	R405.2.2 R405.4.2
☐	**6.** Leakage rates that exceed seven (7) air changes per hour shall indicate Fail.	R402.4.1.2
☐	**7.** Leakage rates exceeding the design rate from the compliance report shall not "Pass" even though it is under (7) air changes per hour.	R405.2.2 R402.4.1.2
☐	**8.** Buildings with (ACH) rates less than three (3) shall add whole-house mechanical ventilation to the building and be indicated on the test report. **(TR-4)**	R403.6 RBC R303.4
☐	**9.** A revised mechanical plan showing compliance with the residential building code shall be provided when whole-house ventilation is required.	R103.4

BORA Electrical Checklist

Performance Pathway Only

Plan Review	Code Section
Scope and Administrative	**Chapter 1**
☐ **1.** The administrative checklist on page #5 has been completed.	
☐ **2.** The energy compliance Report shall match the plans and shall comply with the following:	R405.4.2
☐ Comfort heating and service water heating appliances using electricity shall be shown. (Item 14 & 15)	R405.4.2
☐ When the energy compliance report indicates a ceiling fan energy credit. The required Energy Star fans and blade sizes shall be shown. (Item 16) **(E-1)**	R405.7.6 Table R405.7.6
☐ **3.** The following information shall be submitted and shown on the plans	R103.2
☐ When the energy compliance report indicates a ceiling fan energy credit, the required fans and blade sizes shall be shown.	R405.7.6
☐ The electrical floor plans shall identify all recessed luminaires installed in the building thermal envelope and show sealing details.	R402.4.5 R103.2 (8)
☐ Recessed lighting shall be IC-rated and labeled as having an air leakage rate of no more than 2.0 cfm when tested in accordance with ASTM E283.	R402.4.5
☐ The Luminaire Schedule shall identify the high-efficacy lamps. Not less than ninety (90) percent of the lamps in all permanently installed luminaires, excluding those in kitchen appliances, shall have an efficacy of at least forty-five (45) lumens-per-watt or shall utilize lamps with an efficacy of not less than sixty-five (65) lumens-per-watt.	R404.1
Rough Inspection	
☐ **1.** Air-sealed electrical and communication boxes that penetrate the air barrier of the building shall be sealed to the air barrier element being penetrated. Air-sealed boxes shall be buried in or surrounded by insulation. When factory air-sealed boxes are used, they shall be marked "NEMA OS 4" and installed in accordance with the manufacturer's instructions.	R402.4.6 Table R402.4.1.1
☐ **2.** Thermal envelope penetrations by electrical conduits and cables in the wall top plate shall be sealed.	R402.4.1.1 Table R402.4.1.1
Final Inspection	**C402.5**
☐ **1.** Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.	R402.4.5
☐ **2.** Ceiling fans shall be installed per the electrical drawings.	R405.7.6

BORA Plumbing Checklist
Performance Pathway Only

Plan Review	Code Section
Scope and Administrative	**Chapter 1**
☐ **1.** The administrative checklist on page #5 has been completed.	
☐ **2.** The energy compliance report shall match the plans and shall comply with the following:	R405.4.2
☐ Size and efficiency of the service water heating appliance. (Item 15)	R103.2 (5)
☐ **3.** The following information shall be submitted and shown on the plans.	R103.2
☐ Provide efficiency documentation for water heaters. A copy of the AHRI certificate or manufacturer's data showing the efficiency is required. Water-heating equipment installed in residential units shall meet the minimum efficiencies in Table C404.2. **(P-1)**.	R405.4.3 (2) R403.5.6.2
☐ Provide efficiency documentation for pool heaters. Gas and oil-fired pool and spa heaters shall have a tested minimum thermal efficiency of 82 percent. Heat pump pool heaters shall have a minimum COP of 4.	R103.2 (5) R403.10.4 R403.10.5
☐ If a heated water circulation system is installed, it shall be provided with circulation pump controls that will both:	R403.5.1
☐ Start the pump on-demand. (Button, motion detector, or timeclock)	
☐ Stop the pump when the desired temperature is reached.	
☐ Residential pools shall meet the requirements of APSP-15 (Standard for Energy Efficiency for Residential Inground Swimming Pools and Spas).	R403.12
Rough Inspection	
☐ **1.** The administrative checklist on page #5 has been completed.	
☐ **2.** If a heated water circulation system is installed, it shall have an accessible circulation pump. The automatic controls, temperature sensors, and manual controls shall be readily accessible for operation.	R403.5.1
Final Inspection	
☐ **1.** Water heating model numbers and equipment efficiencies shall be verified and match the plumbing plans. **(P-1)**	R403.5.6.2
☐ **2.** Electric, gas, and oil-type pool and spa heating equipment efficiencies shall be verified and match the plans.	R403.10
☐ **3.** Gas and oil-type water heaters for permanent pools and spas shall be equipped with a vapor retardant cover on or at the water surface. A liquid cover or other means proven to reduce heat loss may be used and shall be on the job for the final inspection. **Note:** Heat pumps and solar-type heaters are excluded from this requirement.	R403.10.3

APPENDIX A

Residential Energy Code Compliance Review Form

PERMIT # _____ ADDRESS _____

A review of the plans and specifications covered by this compliance report indicates compliance with the 2023 Florida Energy Conservation Code.

DISCIPLINE	**NAME**	**SIGNATURE**	**DATE**
STRUCTURAL			
MECHANICAL			
PLUMBING			
ELECTRICAL			

APPENDIX B

Residential Fenestration Product Rating Submittal Form

In accordance with the Florida Energy Conservation Code R303.1.3, this form can be used as a tool for the submittal process to document the proposed energy product rating for windows, doors, and skylights.

Recommended for Review:

- Copy of the approved input report from the Energy Calculations showing each fenestration design rating (U-value, SHGC, and VT) for all fenestration in the building.

  Include a list of each window's NFRC Certified Product Directory number showing the U-Value, SHGC, and VT on the attached form. These numbers may be found on the NFRC website: https://search.nfrc.org/search/searchDefault.aspx.

Window Number	**NFRC Directory Number*	*Description*	*U-Value*	*SHGC*	*VT*
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					

Window Number	**NFRC Directory Number*	*Description*	*U-Value*	*SHGC*	*VT*
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
31					
33					
34					
35					
36					
37					
38					

Notes:

- Products not listed in the NFRC directory shall be tested by an accredited, independent laboratory in accordance with FBCEC R303.1.3. Products not tested and lacking certification and labeling shall be assigned a default rating from the energy tables.
- Products submitted that do not match the approved Energy Calculations shall require a revised energy compliance report or window submittal per FBCEC R103.4.
- *Products not tested and labeled use the default tables in R303.1.3.

Appendix C

TABLE R303.1.3(1)
DEFAULT GLAZED FENESTRATION U-FACTORS

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT	
			SINGLE	DOUBLE
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

TABLE R303.1.3.(2)
DEFAULT OPAQUE DOOR U-FACTORS

DOOR TYPE	U-FACTOR
Uninsulated Metal	1.20
Insulated Metal	0.60
Wood (Other	0.50
Insulated, nonmetal edge, max 45% glazing. Any glazing double pane	0.35

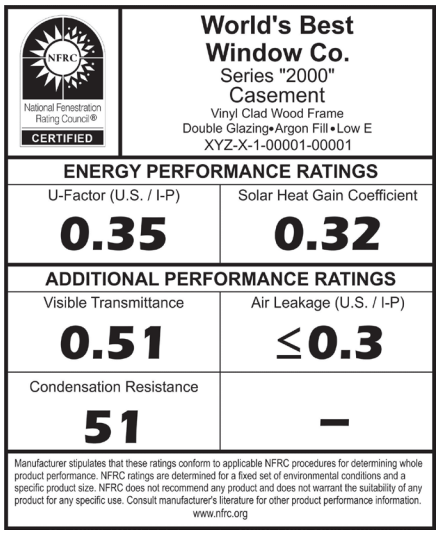
TABLE R303.1.3 (3)
DEFAULT WINDOW, GLASS DOOR, AND SKYLIGHT SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	CLEAR	TINTED	CLEAR	TINTED	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

Appendix D

Structural Notes

S-1. Windows must be tested for energy efficiency if the compliance report does not use default values in Table R303.1.3. U-factors shall be determined in accordance with standard NFRC 100. The VT and the SHGC (Solar Heat Gain Coefficient) shall be determined in accordance with standard NFRC 200. Testing must be done by an accredited independent laboratory and then labeled and certified by the manufacturer. NFRC standards require both computer simulation and physical test results to be validated by an independent agency (IA). Energy values validated by an independent agency (IA) shall match the product's label per Florida Building Code Energy Conservation R303.1.3.



S-2 The plans shall specify what type and R-value of insulation will be installed. It is not acceptable to have comments on the plan details that indicate: “See energy calculations”. Baffles are required for blown-in insulation to keep the vents from becoming blocked upon installation and drift.

Mechanical Notes

M-1 The conditioned floor area is found on the architectural plans. The ceiling areas shall match the conditioned floor area on single-story homes with a flat ceiling height throughout the home. On a two-story home, the second-floor conditioned floor area shall match this ceiling area plus any area that is only one story. “Knee walls” occur when ceiling heights change from a vaulted ceiling to a lower ceiling height. Knee walls adjacent to the attic area shall be listed separately as ceiling area on the compliance report. Knee walls shall not be shown as exterior wall areas. (See Figure A)

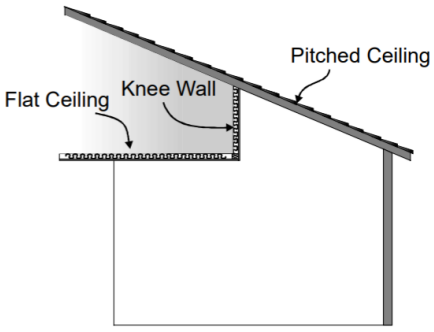


Figure A

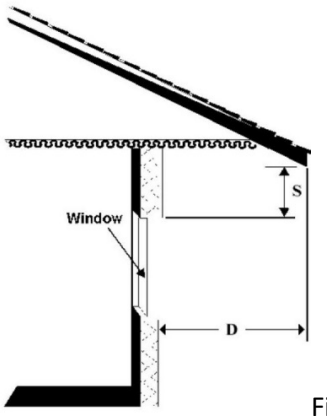


Figure B

Appendix D (Continued)

Mechanical Notes

M-2 Overhang measurements shall match what is listed on the compliance report. Overhangs are measured in terms of "Depth" and "Separation". The "Depth" is the horizontal measure protruding from the building. The "Separation" is the vertical distance from the overhang to the top of the window. (See Figure B)

M-3 Energy credits shall be verified. The credits are indicated by abbreviations on the compliance report or statement notes at the bottom.
Examples: PSTAT- Programmable Thermostat, **RB**- Radiant Barrier, **CV**- Cross Ventilation, **WHF**- Whole House Fan, **CF**- Ceiling Fans, **HRU**- Heat Recovery Unit, **HP**- Heat Pump.
Tested "Cool Roof" roof absorption and emittance test values and a "Duct Leakage Test Report" lower than 8% default leakage are possible credits shown in the notes.

M-4 The mechanical attachment and sealing of the flexible ductwork's collar and inner core are hidden from the inspector by the insulation and vapor barrier during assembly. The tabs shall be bent over, and a draw-band shall be installed for a proper mechanical attachment. The collar flange and the inner core shall also be sealed airtight. The draw-band is not a code-approved seal for flexible ducts. Flexible duct joints shall be spot-checked for compliance with this section by having the contractor open the duct joint for visual inspection.

M-5 Certificates may be obtained by going to the AHRI Certification Directory to verify that the equipment is designed to be operated together.

Envelope Leakage Test Report Notes

TR-1 The FBC-approved software will generate an approved "Envelope Leakage Test Report" form and fill in the necessary information, such as the volume and the required air change rate specified by the designer.

TR-2 The designer of record chooses which method of energy code compliance, whether performance or prescriptive. The testing agent shall not use prescriptive standards when the designer selects the performance method of compliance.

TR-3 The design air changes per hour rate chosen by the designer of record is indicated in the box on the test report form when using the performance R405-2023 compliance software. The specified design rate is also found at the bottom of the front page of the compliance report.

TR-4 It is the code official's responsibility to ensure this box is checked when the air change rate is less than three (3) air changes per hour. This selection shall trigger the mechanical designer of record to determine which ventilation method they use to increase ventilation. A revised mechanical plan shall be submitted and approved before a final is approved.

Plumbing Notes

P-1 The efficiency of the domestic water heaters shown on the compliance report shall be shown in UEF. The AHRI efficiency is obtained from the manufacturers data, or an AHRI certificate shall be provided.

Electrical Notes

E-1 When a ceiling fan credit is taken, the Energy Star ceiling fans shall be indicated on the electrical drawings. Future fans shall not be indicated when this credit is taken. The fans shall be installed per the plans at the electrical final inspection according to Table R405.7.6. Ceiling fans shall be installed in each of the bedrooms and a minimum of one living area to receive credit.

Appendix D (Continued)

TABLE R405.7.6
FAN SIZING TABLE

LONGEST WALL LENGTH (feet)	MINIMUM FAN SIZE (inches)
= 12	36
>12-16	48
>16-17.5	52
>17.5-25	56
>25	Two (2) fans (Minimum of 48 inches each)