Board of Rules and Appeals

Commercial Energy Guidelines

C401.2 (3): FBCEC 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: 12/31/2023

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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.

Building Code Administrators Checklist
Performance Pathway Only

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 (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 C101.4.2.1 through 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 a *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 do 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 newly conditioned buildings in climate zone1 (Broward County) shall have a minimum tested solar roof reflectance and thermal emittance per Table C402.3 ***(S-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

BORA Structural Checklist (Continued)

Performance Pathway Only

Structural Rough Inspection	**C104.2.2**
☐ **13.** 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-2)***	C303.1.3
☐ **14.** 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
☐ **15.** 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
☐ **16.** 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

BORA Mechanical Checklist (Continued)

Performance Pathway Only

Plan Review	Code Section
Building Mechanical Systems	**C403**
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 pipe insulation shall be installed according to the manufacturer's instructions.	C303.2
27. Duct and pipe insulation shall meet the minimum R-value specified. (See exceptions)	C403.2.9.1.1 C403.2.10

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 C403.2.9.1.3
☐ **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 through 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) through 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	C402.5.8
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.	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. (Note: IP65 Rating for wet locations and sealed conduits are required)	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

BORA Electrical Checklist (Continued)
Performance Pathway Only

☐	**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 exceeds 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 an 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

BORA Electrical Checklist (Continued)

Performance Pathway Only

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 to comply with one of the following three options:	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.

S-3. According to C402.3, for climate zone 1a, the designer of record must submit a roofing product that has been tested to give a value of:

1a) Three-year aged solar reflectance of at least 0.63 that is tested in accordance with ASTM C1549, ASTM E903, or CRRC-1 Standard.

Note: *The higher the solar reflectance ratio, the better (the amount of solar energy that is reflected).*

1b) Three-year aged thermal emittance of at least 0.75 that is tested in accordance with ASTM C1371, ASTM E408, or CRRC-1 Standard.

Note: *The higher the thermal emittance value, the better (the more heat the roofing material emits back to the atmosphere).*

Or the product must have a:

2) Solar reflectance index (SRI) of at least 75 (shall be determined in accordance with ASTM E1980)
Note: The Solar Reflectance Index (SRI) is an indicator of the ability of a roof surface to return solar energy to the atmosphere. *(Roofing material surfaces with a higher SRI will be cooler than surfaces with a lower SRI under the same solar energy exposure.)*

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 through 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, Eighth Edition (2023) Energy Conservation.

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