



Energy - Not a Glitch

Glitch Modifications

This document created by the Florida Department of Community Affairs -
850-487-1824

Total Mods for E\^: 9

Date Submitted	3/18/2011	Section	101.4.7.1.1	Proponent	Arlene Stewart
Chapter	4	Affects HVHZ	No	Attachments	Yes
TAC Recommendation	Pending Review				
Commission Action	Pending Review				
Comments					
General Comments	No	Alternate Language	No		

Related Modifications

4870

Summary of Modification

Mod adds criteria for who can test a duct system and the conditions of the test

Rationale

This modification fixes an inconsistency in state law implementation (glitch reason f) coupled with conflict fix within the updated integrated code (glitch reason a). It is Florida specific because it completes State legislation implementation. Impact to small business will be reduced because repeated justification for multiple compliance requirements will be unnecessary.

First, Section 101.4.7.1.1 implements HB 663 into FS 553.912. The Energy Code Workgroup consensus language intended to allow alternatives to the inspection. However, the section does not adequately cross reference FS 553.995(4) which includes oversight for duct testing competency in the state. This modification clearly adds this cross reference by citing a BERS Class 1 rater as the named test entity.

The HVAC rebate program from September 2010 provided some valuable learned lessons about the unintended consequences from the lack of a clear citation. The Supporting file shows where both BERS and non BERS entities (who were allowed to do testing) submitted inappropriate and non-compliant test results from a number of unapproved test methods. Because the BERS rule requires a demonstration of competency for duct testing every three years, it is the currently appropriate qualification for executing exception 3 along with an oversight authority when rater competency is questioned.

Second, the method for testing ducts is currently found under Section 202 for the definition of substantially leak free, while exception 3 cites no test method at all. Moreover the 202 definition also has a pass threshold. A direct cross-reference of the definition would be a conflict because it was not the workgroup's intention that existing ducts be made leakfree. Rather it was to allow an alternative, while maintaining the cost-effective exception for existing duct work. Therefore the modification inserts the established test method found in Section 202, without the pass threshold.

Fiscal Impact Statement**Impact to local entity relative to enforcement of code**

It reduces the cost to the local entity by reducing the time officials will need to enforce the provision

Impact to building and property owners relative to cost of compliance with code

There is no cost impact for this modification

Impact to industry relative to the cost of compliance with code

There is no cost impact for this modification

Requirements**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**

This mod has a resason and substantial connection to the welfare of the general public by ensuring qualified individuals will execute the provision in a uniform manner

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

It improves the code by requiring an established competency for the provision

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

It does not discriminate because the modification relies on a non-biased demonstration of competency.

Does not degrade the effectiveness of the code

it increases the effectiveness of the code because it requires an established test method and qualification

101.4.7.1 Replacement HVAC equipment

101.4.7.1.1 Ductsealing upon equipment replacement (Mandatory). At the time of the total replacement of HVAC evaporators and condensing units all accessible (a minimum of 30 inches clearance) joints and seams in the air distribution system shall be inspected and sealed where needed using reinforced mastic or code approved equivalent and shall include a signed certification by the contractor that is attached to the air handler unit stipulating that this work has been accomplished.

Exceptions:

1. Ducts in conditioned space.
2. Joints or seams that are already sealed with fabric and mastic.
3. If system is tested at a pressure differential of 25 Pascal (0.10 in. w.c.) across the replaced air distribution system, including the manufacturer's air handler enclosure, by a FL Class 1 BERS Rater and repaired as necessary.

6.0 Confirmed HERS Index at Time of Audit

The confirmed HERS Index for the existing home is 106.

Form FBRER-2008

Confirmed Rating

Design: Sarasota, FL
TMY: SARASOTA, BRADENTON, FL

BUILDING ENERGY RATING GUIDE

\$0 **\$2356** Reference \$2312

0 MBtu **54.8 MBtu** 54 MBtu

Proposed Home

Cost Basis:
MyFloridaAverage
Florida Average
Statewide Prices

Electric Rate: \$0.120 /kWh
Gas Rate: \$2.119 /Therm
Oil: \$2.30/gal LP Gas: \$2.40/gal

Cooling	\$938
Heating	\$38
Hot Water	\$300
Col. Fan	\$60
Dehumidif.	\$21
Dryer	
Lighting	\$147
Misc.	\$478
Pumps	
Range	\$54
Refrig.	\$65
PV	

Certified Rater: [Redacted] I.D. Number: 1012

Signature: [Redacted] Date: [Redacted]

This Rating Guide is provided to you by a Home Energy Rater who is trained and certified to perform Ratings in accordance with the RESNET Standard. Questions or complaints regarding this Rating may be directed to:
EnergyGauge Program Office
1878 Clearlake Road
Cocoa, FL 32922-5703
()
energyga@flor.net

NOTES:
HERS Index calculated in accordance with 2006 RESNET standard, Section 303.2 (Reference home = 100, Zero energy use = 0).

10/3/2010 8:31:48 PM EnergyGauge® USA ResRate Z008AUSRZB v2.0 Page 1/1

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Air Distribution System Test Report

For use when part of an Air Distribution System has been replaced (voluntary test for use with N1100.0.2)

**THE FINAL INSPECTION MUST BE APPROVED
BEFORE THIS FORM CAN BE FILED WITH THE BUILDING DEPARTMENT**
The air distribution system leakage test may be performed before or after the final inspection date.

Owner:	[Redacted]	Contractor name:	[Redacted]
Street address:	[Redacted]	Jurisdiction:	
City:		Permit No.:	
Zip: 33146		Final inspection date:	

Air Distribution System Leakage Test Results

Line	System	Duct Leakage
1	System 1	1050 cfm25 (out or tot) circle test type
2	System 2	cfm25 (out or tot) circle test type
3	System 3	cfm25 (out or tot) circle test type
4	System 4	cfm25 (out or tot) circle test type
	Use appropriate calculation method	
5		Sum lines 1-4 1050
6	Total House Duct System Leakage When there is only one system or when all systems have been replaced	Divide by 928 = 1.13 (Qn, out or tot) (total conditioned floor area) (circle test)
OR		
7	Replacement system duct system leakage When there are multiple systems and only one or some of the systems have been replaced	Divide Line 5 by _____ = _____ % Leakage, (out or tot) (total rated air handler flow) (circle test)

I have tested the air distribution system(s) referenced by the permit listed above at a pressure differential of 25 Pascals (0.10 in. w.c.) in accordance with methods found in:

- N1110.A.2 of the Florida Building Code-Residential
- 13-610.A.2 of the Florida Building Code: Energy
- Sub-Appendix 13-2C, CS2.2.1.1 of the Florida Building Code: Energy

The replaced system is leak-free and is therefore compliant with N1100.0.2 and Form 1100B
 uses existing ductwork and is therefore compliant with N1100.0.2, exception 2

I possess the qualifications found in the selected citation to perform this work.

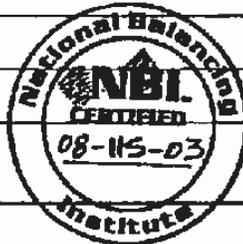
Signature: [Redacted] Date: 09-10-10

Printed Name: [Redacted]

FL BERS Rater Certification #: _____

(or) DPBR Mechanical License #: _____

(or) T&B Certification # and issuing organization or jurisdictional recognition: _____



For Building Department use only:

Form received by: _____ Date: ____/____/____

INSTALLATION CERTIFICATE		CF-GR-MECH-21-HKRS	
Duct Leakage Test - Existing Duct System			
Owner name & phone:		Enforcement Agency:	Permit Number:
Address:		Building & Safety	2010-055094

(Page 2 of 2)

*NOTE SEALED MAIN PLENUM WITH
TAPE, MASTIC, MEMBRANE*

- Outside air (OA) ducts for Central Fan Integrated (CFI) ventilation systems, shall not be sealed/taped off during duct leakage testing. CFI OA ducts that utilize controlled motorized dampers, that open only when OA ventilation is required to meet ASHRAE Standard 62.2, and close when OA ventilation is not required, may be configured to the closed position during duct leakage testing.
- All supply and return register boots must be sealed to the drywall if mastic test is utilized for compliance - applies to duct leakage compliance option 3 (leakage reduction by 60%) and option 4 (fix all accessible leaks) described above.
- New duct installations cannot utilize building cavities as plenums or platform returns in lieu of ducts.
- Mastic and draw bands must be used in combination with cloth backed rubber adhesive duct tape to seal leaks at all new duct connections.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Building and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I understand that a HERS rater will check the installation to verify compliance, and that if such checking identifies defects, I am required to take corrective action at my expense. I understand that Energy Commission and HERS provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if these installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- I will ensure that a completed, signed copy of this Installation Certificate shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy. I will ensure that all Installation Certificates will come from a HERS provider data registry for multiple orientation alternatives, and beginning October 1, 2010, for all low-rise residential buildings.

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)			
Responsible Person's Name:		Responsible Person's Signature:	
CELB License:	Date Signed:	Position With Company (Title):	
CAC 1916043	9-10-10	OWNER / President	
Is this installation monitored by a Third Party Quality Control Program (TPQCP)?		Name of TPQCP (if applicable):	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			

COPY

INSTALLATION CERTIFICATE		CF-GR-MECH-21-HERS
Duct Leakage Test - Existing Duct System		
Owner name & phone: _____		(Page 1 of 2)
Address: _____	Enforcement Agency: Building & Safety	Permit Number: 2010-05509U

Enter the Duct System Name or Identification/Tag: 5 TON A/C SYSTEM SPLIT

Enter the Duct System Location or Area Served: Existing home

Note: Submit one Installation Certificate for each duct system that must demonstrate compliance in the dwelling.

This installation certificate is required for compliance for alterations and additions in existing dwellings to space conditioning systems and duct systems.

Note: For existing dwellings, a completely new or replacement duct system can also include existing parts of the original duct system (e.g., register boots, air handler, coil, plenums, etc.) if those parts are accessible and they can be sealed. For a completely new or replacement duct system installed in an existing dwelling, use the Installation Certificate titled "Duct Leakage Test - Completely New or Replacement Duct System."

Duct Leakage Diagnostic Test - Existing Duct System

- Select one compliance method from the following four choices.
- Option 1. Measured leakage less than 15% of Fan Airflow.
 - Option 2. Measured leakage to outside HERS min 10% of Fan Airflow.
 - Option 3. Reduce leakage by 60% or more, and conduct smoke test to seal all accessible leaks.
 - Option 4. Fix all accessible leaks using smoke test, and HERS rater must verify.
- Note: (Option 1 must be attempted before utilizing Option 4)

Determine nominal Fan Airflow using one of the following three calculation methods.

Cooling system method: Size of condenser in Tons 5 x 400 = 2000 CFM

Heating system method: 21.7 x _____ Heating Output Capacity (kBtu/h) = _____ CFM

Measured system airflow using RA3.3 airflow test procedure: _____ CFM

1	Option 1 used then: Allowed leakage = Fan Airflow <u>2000 CFM</u> x 0.15 = <u>300</u> CFM Actual leakage = <u>175</u> CFM	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
	Pass if Actual leakage is less than Allowed leakage	
2	Option 2 used then: Allowed leakage = Fan Airflow _____ x 0.10 = _____ CFM Actual leakage to outside = _____ CFM	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
	Pass if Actual leakage to outside is less than Allowed leakage	
3	Option 3 used then: Initial leakage prior to start of work = _____ CFM Final leakage after sealing all accessible leaks using smoke test = _____ CFM Initial leakage _____ - Final leakage _____ = Leakage reduction _____ CFM (Leakage reduction _____ / Initial leakage _____) x 100% = % Reduction	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
	Pass if % Reduction > 60%	
4	Option 4 used then: All accessible leaks repaired using smoke test. HERS rater must verify (No sampling).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
	Pass if all accessible leaks have been sealed using Smoke Test	

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Duct Leakage Flow Hood Test Report

Report Prepared For: [REDACTED]
 Prepared By: [REDACTED]
 System Description: Whole House

Date Of Test: September 20, 2010
 Living Area: 1,350 square feet on 1 Story; 2 Bedrooms; 8 ft Avg. Ceiling Height
 Duct to duct zone: 25 Pa of pressure

Flow Hood Leakage Readings				TEST	Square
				CFM:	Inches @
					25 pa
Return Leakage				0	0
Supply Leakage	12	10	8	8	7
				38	7

Total Duct Leakage Corrected to 25 Pa	38	7
New Construction Maximum Duct Leakage Standard Based On Air Conditioner Size:	60	11
Actual Leakage vs. Recommended Maximum for New Homes:	64%	
Alternative Maximum Allowable Leakage Standard Based On Living Area For All Duct Systems In Home:	41	8

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Date Submitted	3/18/2011	Section	101.4.7.1.1	Proponent	Arlene Stewart
Chapter	4	Affects HVHZ	No	Attachments	No
TAC Recommendation	Pending Review				
Commission Action	Pending Review				
Comments					
General Comments	No	Alternate Language	No		

Related Modifications

4870, 4874

Summary of Modification

Mod provides a solution for unintended inspection difficulties that will arise from requiring certification for only one compliance provision for new FS 553.912.

Rationale

This modification fixes unintended consequences (glitch reason d) from a partial implementation requirement. It is Florida specific because it completes State legislation implementation. Impact to small business will be reduced because repeated justification for multiple compliance requirements will be unnecessary.

Section 101.4.7.1.1 implements HB 663 into FS 553.912 (completing implementation of new Florida law is the Florida specific reason). However there are unintended enforcement results (glitch reason d) from requiring only one compliance provision to be certified. A survey of more than 50 enforcement officials indicates that the absence of the signed certification required (originally placed before the exceptions) could mean that the required inspection was forgotten or that one of the three exceptions was being met. It would be time-consuming for the inspector to have to track down the compliance method, leading to higher costs not only to the building department and building owner but also for the small business builder (impact to small business). Conversely, it could lead to an excessive number of "failures" that were not in fact, failures - rather compliance alternatives, again costly to small business who have to explain what actually happened (more impact to small business).

By shifting the certification language after the exceptions, plus providing a standard form with check boxes for all the compliance options, the change streamlines compliance, making the cost to implement minimal as was originally intended by the Energy Workgroup as well as making the provision easier to enforce and comply with.

Fiscal Impact Statement**Impact to local entity relative to enforcement of code**

It reduces the cost to the local entity by reducing the time officials will need to enforce the provision

Impact to building and property owners relative to cost of compliance with code

There is no cost impact for this modification

Impact to industry relative to the cost of compliance with code

There is no cost impact for this modification

Requirements**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**

This mod has a resason and substantial connection to the welfare of the general public by providing a uniform way of implementing the provision

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

It improves the code by requiring all compliance methods to be recorded in the same manner

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

It does not discriminate because the modification requires all compliance methods to be recorded in the same manner

Does not degrade the effectiveness of the code

it increases the effectiveness of the code because it provides consistency which in turn allows officials to enforce the code in the same manner.

101.4.7.1 Replacement HVAC equipment

101.4.7.1.1 Ductsealing upon equipment replacement (Mandatory). At the time of the total replacement of HVAC evaporators and condensing units all accessible (a minimum of 30 inches clearance) joints and seams in the air distribution system shall be inspected and sealed where needed using reinforced mastic or code approved equivalent. ~~and shall include a signed certification by the contractor that is attached to the air handler unit stipulating that this work has been accomplished.~~

Exceptions:

1. Ducts in conditioned space.
2. Joints or seams that are already sealed with fabric and mastic.
3. If system is tested and repaired as necessary.

A signed certification (Form 420) by the contractor shall be attached to the air handler unit stipulating the work accomplished and/or the compliance method.

Date Submitted	2/18/2011	Section	402.1.1	Proponent	Darrell Winters
Chapter	4	Affects HVHZ	No	Attachments	Yes
TAC Recommendation	Pending Review				
Commission Action	Pending Review				
Comments					
General Comments	No	Alternate Language	No		

Related Modifications

none

Summary of Modification

To correct language in Table 402.1.1 footnote "a" to match that approved at the ICC Final Action Hearing in Charlotte, NC.

Rationale

THIS PROPOSAL FALLS WITHIN THE GLITCH CRITERIA BECAUSE THE EXISTING LANGUAGE CONFLICTS WITH THE UPDATED CODE. THE LANGUAGE SHOULD BE CORRECTED BY ALL JURISDICTIONS THAT ADOPT THE CODES, SO IT IS FLORIDA SPECIFIC FOR THIS REASON. THIS PROPOSAL WILL NOT INCREASE COSTS TO SMALL BUSINESSES. IT COULD ELIMINATE CODE COMPLIANCE ISSUES FOR INSULATION CONTRACTORS (SMALL BUSINESSES) BECAUSE THE NEW LANGUAGE IS MUCH CLEARER FOR INSTALLERS AND CODE OFFICIALS.

Fiscal Impact Statement**Impact to local entity relative to enforcement of code**

WILL IMPROVE CODE ENFORCEMENT BY MAKING THE FLORIDA CODE CONSISTENT WITH THE NATIONAL CODE.

Impact to building and property owners relative to cost of compliance with code

NO IMPACT RELATIVE TO COST OF CODE COMPLIANCE.

Impact to industry relative to the cost of compliance with code

THERE IS NO COST TO INDUSTRY, INCLUDING SMALL BUSINESSES.

Requirements**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**

By providing improved language, the general public will have a better understanding of the code.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Makes the Florida code language consistent with International Code.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No discrimination against any material, product or system.

Does not degrade the effectiveness of the code

No degradation; improves the language of the Florida code.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. ~~R-19 batts compressed into a nominal 2 × 6 framing cavity such that the *R*-value is reduced by R-1 or more shall be marked with the compressed batt *R*-value in addition to the full thickness *R*-value. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed *R*-value of the insulation shall not be less than the *R*-value specified in the table.~~

a. *R*-values are minimums. *U*-factors and SHGC are maximums. ~~R-19~~ batts compressed into a nominal 2 × 6 framing cavity such that the *R*-value is reduced by R-1 or more shall be marked with the compressed batt *R*-value in addition to the full thickness *R*-value. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table. See Section 303.2.1.

Date Submitted	3/18/2011	Section	402.5	Proponent	Eric Lacey
Chapter	4	Affects HVHZ	No	Attachments	Yes
TAC Recommendation	Pending Review				
Commission Action	Pending Review				
Comments					
General Comments	No	Alternate Language	No		

Related Modifications

4320, 4382

Summary of Modification

This proposal restores a mandatory section of the IECC that is necessary to maintain equivalency between the Florida Building Code and state and federal law.

Rationale

This proposal restores a section that was removed from the original draft of the Florida Building Code by proposal 4320. For the sake of clarity the section (originally Section 402.5 of the 2009 IECC) has been edited to include only the requirements that apply to Florida's climate zone. There was considerable confusion at the Florida Building Commission regarding the fenestration maximums, and a number of Commissioners were unsure exactly what proposal 4320 did. See the attached document for the specific criteria required for a glitch change as outlined in the February 16, 2011 notice.

Fiscal Impact Statement**Impact to local entity relative to enforcement of code**

There will be no impact on local enforcement.

Impact to building and property owners relative to cost of compliance with code

There should be little or no cost impact.

Impact to industry relative to the cost of compliance with code

There should be little or no cost impact.

Requirements**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**

This proposal will save energy and reduce summer peak electrical demand.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This proposal is necessary to ensure equivalency to the national model code.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This proposal does not discriminate among products.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

402.5 Maximum fenestration SHGC (Mandatory). The area-weighted average maximum fenestration SHGC permitted using trade-offs from section 404 shall be 0.50.

Glitch Proposal to Restore Fenestration Maximums

Add the following section:

402.5 Maximum fenestration SHGC (Mandatory). The area-weighted average maximum fenestration SHGC permitted using trade-offs from section 404 shall be 0.50.

(A) This proposal fits squarely within three of the stated glitch criteria.

1. Fenestration maximums are necessary to ensure the equivalency of the Florida Building Code to the relevant standard (the 2009 International Energy Conservation Code).

- The area-weighted maximum fenestration SHGC requirement has been designated “Mandatory” in the 2004, 2006, 2009 editions of the IECC, and it will remain mandatory in the 2012 IECC. A building energy code that does not contain this mandatory safeguard is simply not equivalent to the IECC. Without the fenestration maximums, the Florida Building Code would allow the construction of homes with fenestration that would not comply with the 2009 IECC.
- Effective control of solar heat gain is a critical component of Florida’s energy requirements. High solar gain windows drive up air conditioning use, increase summer peak electricity demand, and cause occupant discomfort. Peak electricity is scarce and more expensive, and is the usually the driving factor behind utilities’ needs to build additional power plants. By contrast, homes built with low-SHGC windows can be built with smaller air-conditioning equipment both at initial construction and every 10-15 years when equipment must be replaced. This will save homeowners money many times over the lifetime of the home. The fenestration maximums stand as a simple, effective backstop to ensure a reasonable level of solar heat control in residential buildings.

2. Fenestration maximums are necessary to maintain consistency with Florida Statutes.

- Florida Statutes Chapter 553.73(7)(a) requires the Florida Building Commission to “update the Florida Building Code every 3 years. When updating the Florida Building Code, the commission shall select the most current version of the ... International Energy Conservation Code ... to form the foundation codes of the updated Florida Building Code...” The fenestration maximums are designated “Mandatory” in the 2009 IECC, which was the most current published edition of the IECC (and should serve as the “foundation code” per the statute).
- Chapter 553.73(3) allows the Commission to “modify the selected model codes and standards as needed to accommodate the specific needs of this state.” There is nothing unique about Florida that would require elimination of this important

backstop. In reality, given Florida's warm climate, proper control of solar heat gain is more important for Florida than nearly any other state.

- Chapter 553.9061 requires 2010 Florida Building Code to increase the energy-efficiency performance of new buildings by at least 20 percent as compared to the 2004 edition of the code. An energy code cannot be shown to achieve significant improvements in efficiency without at least showing equivalent baseline standards.

3. Fenestration maximums are necessary to maintain consistency with federal law.

- Florida committed to meet or exceed the 2009 IECC for residential construction under the American Recovery and Reinvestment Act (ARRA). The removal of the fenestration maximums will render the Florida Building Code not equivalent to the 2009 IECC for the reasons outlined above.
- Florida will also be required to certify that it has compared its residential building energy code to the 2009 IECC and to determine whether that code meets or exceeds the provisions of that code; if the Florida code deviates, the state must explain the reasons why. See USC 6833(a)(5). In its preliminary determination on the 2009 IECC, the U.S. DOE found that the fenestration maximums could impact occupant comfort or resistance to moisture condensation, "either of which could possibly induce occupants to increase energy consumption, for example by raising thermostat set points." 75 Fed. Reg. 54131, 54140 (Sep. 3, 2010).

(B) This proposal meets a Florida-specific need.

Florida's need to curb peak electricity use, particularly through control of solar heat gain, is well documented. This proposal restores a requirement specifically designed as a backstop in performance-based trade-offs to ensure that no matter how the home is designed, at least a minimum amount of solar control is required in fenestration.

(C) There is likely no negative impact on small business.

This proposal would not affect small business in any unique way. Low-SHGC windows are widely available throughout the state. In fact, at the last Florida Building Commission meeting, the fenestration maximums were wholeheartedly supported by the vast majority of window manufacturers.

Date Submitted	3/18/2011	Section	403.9	Proponent	Jennifer Hatfield
Chapter	4	Affects HVHZ	No	Attachments	No
TAC Recommendation	Pending Review				
Commission Action	Pending Review				

Comments

General Comments No **Alternate Language** No

Related Modifications

4869, 4864

Summary of Modification

Replaces a reference to FL Standards with national consensus standards needed to follow state law that requires energy efficiencies for pools and spas.

Rationale

This proposed code change falls within the glitch criteria stated. It replaces a reference to FL Standards with national consensus standards needed to follow state law that requires energy efficiencies for pools and spas. The national consensus standards follow what was addressed in the FL Standards and what was addressed in the subsections of 403.9 that were removed. It is unnecessary to have both in the body of the code and in the standard. Small business will not be affected by this modification.

Fiscal Impact Statement**Impact to local entity relative to enforcement of code**

None

Impact to building and property owners relative to cost of compliance with code

None

Impact to industry relative to the cost of compliance with code

None

Requirements**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**

Not applicable, making a standards update.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code by eliminating unnecessary Florida specific language and replacing with national consensus standards.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

It does not.

Does not degrade the effectiveness of the code

It does not.

403.9 Swimming pPools, inground spas, and portable spas (Mandatory). The energy requirements for residential pools and inground spas shall be as specified in Sections 403.9.1 through 403.9.3 and ANSI/APSP-15. The energy requirements for portable spas shall be in accordance with ANSI/APSP-14. Pools shall be provided with energy-conserving measures in accordance with Sections 403.9.1 through 403.9.43 and compliance criteria found in Appendix D—Florida Standards, Florida Standard No. 1-2 (FL-1-2), Florida regulatory requirements for energy efficiency for residential inground swimming pools and spas, and Florida Standard No. 2-3 (FL-2-3), Florida regulatory requirements for portable spa energy efficiency.

403.9.1 Pool and spa heaters. All pool heaters shall be equipped with a readily *accessible* on-off switch that is mounted outside the heater to allow shutting off the heater without adjusting the thermostat setting. Gas fired heaters shall not be equipped with continuous pilot lights.

~~**403.9.1.1 Gas and oil-fired pool and spa heaters.** All gas and oil-fired pool and spa heaters shall have a minimum thermal efficiency of 78 percent when tested in accordance with ANSI Z 21.56. Pool heaters fired by natural gas shall not have continuously burning pilot lights.~~

~~**403.9.1.2 Heat pump pool heaters.** Heat pump pool heaters shall have a minimum COP of 4.0 when tested in accordance with ARI 1160, Table 2, Standard Rating Conditions Low Air Temperature. A test report from an independent laboratories is required to verify procedure compliance.~~

~~**403.9.1.3 Portable spa standby power.** Portable electric spa standby power shall not be greater than $5(V^{2/3})$ watts where V = the total volume, in gallons, when spas are measured in accordance with the spa industry test protocol.~~

403.9.2 Time switches. Time switches shall be installed to control on swimming pool heaters and pumps that can automatically turn off and on the heaters and pumps off and on according to a preset schedule shall be installed on swimming pool heaters and pumps.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Where pumps are required to operate solar- and waste-heat-recovery pool heating systems.
3. Where pumps are powered exclusively from on-site renewable generation.

403.9.3 Pool eCovers. Heated swimming pools and inground permanently installed spas shall be equipped with a vapor-retardant pool cover on or at the water surface or a liquid cover or other means proven to reduce heat loss. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12.

Exception: Outdoor pPools deriving over 70 60 percent of the energy for heating from site-recovered energy or solar energy source computed over an operating season.

403.9.4 Pool design. Residential pool pumps and pump motors. Pool filtration pump motors shall meet the following requirements, along with the compliance criteria provided for in FL-1-2, Appendix D.

403.9.4.1 Pool pump motors. Pool pump motors shall meet the following criteria:

1. Pool pump motors shall not be split-phase, shaded-pole or capacitor start-induction run types.

~~2. Pool pumps and pool pump motors with a total horsepower (HP) of ≤ 1 HP shall have the capability of operating at two or more speeds. The low speed shall have a rotation rate of no more than $\frac{1}{2}$ of the motor's maximum rotation rate.~~

~~3. Pool pumps motor controls shall have the capability of operating the pool pump at a minimum of two speeds. The default circulation speed shall be the residential filtration speed, with a higher speed override capability for a temporary period not to exceed one normal cycle or 120 minutes 24 hours, whichever is less.~~

~~**Exception:** Solar pool heating systems shall be permitted to run at higher speeds during periods of usable solar heat gain.~~

~~**403.9.5 Portable spa standby power.** Portable electric spa standby power shall not be greater than $5(V^{2/3})$ watts where V = the total volume, in gallons, when spas are measured in accordance with the spa industry test protocol provided in FL-2 3, Appendix D.~~

Date Submitted	2/21/2011	Section	Table 502.1.1.1	Proponent	Mike Ennis
Chapter	5	Affects HVHZ	No	Attachments	Yes
TAC Recommendation	Pending Review				
Commission Action	Pending Review				
Comments					
General Comments	No	Alternate Language	No		

Related Modifications

Summary of Modification

Change cool roof requirements in Table 502.1.1.1 from absorptance to reflectance to resolve a conflict that currently exists between the Commercial and Residential requirements that are in Table 402.1.1.

Rationale

This code change proposal is being submitted to resolve a conflict within the updated code. The prescriptive requirements for residential construction contained in Table 402.1.1 reference a cool roof requirement of a minimum 0.25 reflectance value. This Table further provides reference to test procedures that manufacturers can use to demonstrate compliance to the code. These requirements and test procedures are commonly referenced in other energy codes such as the IECC. Table 502.1.1.1, which provides prescriptive requirements for commercial construction lists an absorptance value instead of a reflectance value for cool roofs. In addition no guidance in the form of test procedures that can be used to demonstrate compliance to the code requirements are provided. The code change proposal revises Table 502.1.1.1 to reference reflectance values in place of absorptance values to make it consistent with the residential portion of the code, and other energy codes. It also provides reference to a method (ANSI/CRRC-1) that can be used to demonstrate compliance with the code.

Does the code change have a Florida specific need - Yes, cool roofs are a particularly effective energy conservation measure in warm climate zones as demonstrated in various studies. It is well known that the reflective properties of roof surfaces decreases with time, which is why the three year requirement is included as part of the proposal, and is included in ANSI/CRRC-1.

Impact on small businesses - This proposal will have no adverse impact on small business and will allow manufacturers of roof membranes and coatings to demonstrate compliance with the code and make it easier for code officials to verify conformance.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Helps clarify code requirements and provides a method to test the required value.

Impact to industry relative to the cost of compliance with code

Industry has already completed testing to address cool roof requirements in other areas. This change would make the FL Code consistent with other requirements thereby reducing the burden on industry to meet these requirements.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Cool roofs reduce energy consumption in warm climate zones, and can help mitigate the urban heat island impact.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This change would provide a method to measure cool roof properties, and make it consistent with other energy code requirements.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No - this proposal will increase the effectiveness of the code by providing measurable performance criteria that can be used to demonstrate code compliance.

Please see attached support file for text of the modification.

**TABLE 502.1.1.1 (1)
 ENVELOPE PRESCRIPTIVE MEASURES FOR SHELL BUILDINGS^{1,2}**

Building Element	Mandatory
Roof: Absorptance Reflectance R-value (U-value)	Three-year aged solar reflectance of 0.55 and three-year aged thermal emittance of 0.75 or SRI of 64 ⁵ ≤ 0.22 R-40 (≤U-0.025)
Wall: Above grade wall: Absorptance R-value (U-value) Below grade wall:	≤ 0.3 R-30 (≤ U-0.032) No requirement
Raised Floor Insulation R-value (U-value)	R-30 (≤ U-0.032)
Window: U-factor SHGC 0-40% WW Ratio 40-50% WW Ratio > 50% WW Ratio Overhang Projection Factor (PF)	≤ 0.45 0.25 0.19 Not allowed ³ 0.5 ⁴
Door: U-value Swinging Non-swinging	U-0.70 U-1.45
Skylights: SHGC Skylight U-value	≤ 0.19 ≤ 1.36

¹Equipment and lighting shall meet the efficiencies of Section 503, 504 and 505, respectively.

²Per Section 101.4.9 of the *FBC-EC*, the building shall demonstrate compliance with Section 506 when completion of the building is permitted.

³Buildings with greater than 50% WW Ratio shall comply with Section 506.

⁴ PF 0.5 = Projection half the distance of window height.

⁵ – Tested in accordance with ANSI/CRRC-1

Date Submitted	3/3/2011	Section	Table 502.1.1.1	Proponent	T Stafford
Chapter	5	Affects HVHZ	No	Attachments	No
TAC Recommendation	Pending Review				
Commission Action	Pending Review				
Comments					
General Comments	No	Alternate Language	No		

Related Modifications

Summary of Modification

Combine Tables 502.1.1.1(1) and 502.2.1.1(2) into a single table.

Rationale

Eliminate table 502.1.1.1(1) and 502.1.1.1(2) and substitute new Table 502.1.1.1 which combines the requirements into a single table for ease of use. The proposed code change will have no impact on small business.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact

Impact to building and property owners relative to cost of compliance with code

No impact

Impact to industry relative to the cost of compliance with code

No impact

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Not applicable. Corrects a conflict within the updated code.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Not applicable. Corrects a conflict within the updated code.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Not applicable. Corrects a conflict within the updated code.

Does not degrade the effectiveness of the code

Not applicable. Corrects a conflict within the updated code.

TABLE 502.1.1.1.(1)**ENVELOPE PRESCRIPTIVE MEASURES FOR SHELL BUILDINGS^{1,2}****TABLE 502.1.1.1(2)****ENVELOPE PRESCRIPTIVE MEASURES FOR RENOVATIONS AND ALTERATIONS¹****TABLE 502.1.1.1****ENVELOPE PRESCRIPTIVE MEASURES**

BUILDING ELEMENTS	MANDATORY MINIMUM FOR SHELL BUILDINGS^{1,2}	MANDATORY MINIMUM FOR RENOVATION AND ALTERATIONS¹
Roof		
Absorptance	=0.22	=0.22
R-value (U-value)	R-40 (U= 0.025)	R-38 (U= 0.033)
Wall		
Above grade wall:		
Absorptance	=0.3	=0.3
R-value	R-30 (U= 0.032)	R-19 (U= 0.052)
Below grade wall:	No requirement	No requirement
Raised Floor Insulation		
R-value (U-value)	R-30 (U= 0.032)	R-19 (U= 0.052)
Window		
U-factor	=0.45	=0.45
SHGC (by window area)		
0-40% WW Ratio	=0.25	=0.25
40-50% WW Ratio	=0.19	=0.25
>50% WW Ratio	Not Allowed ³	=0.25
Skylights:		
SHGC	=0.19	=0.19
Skylight U-value	=1.36	=1.36
Opaque Door U-value		
Swinging	=-0.19	=U-0.7
Non-swinging	=-1.36	=U-1.45

1 Equipment and lighting shall meet the efficiencies of Section 503, 504 and 505, respectively.

2 Per Section 101.4.9 of the FBC-EC, the building shall demonstrate compliance with Section 506 when completion of the building is permitted.

3 Buildings with greater than 50% WW Ratio shall comply with Section 506.

4 PF 0.5 = Projection half the distance of window height.

Date Submitted	3/18/2011	Section	Form 410	Proponent	Arlene Stewart
Chapter	9	Affects HVHZ	No	Attachments	Yes
TAC Recommendation	Pending Review				
Commission Action	Pending Review				
Comments					
General Comments	No	Alternate Language	No		

Related Modifications

Energy Conservation, may need cross reference to Section 403.2.2.1

Summary of Modification

Modification closes gaps by adding a mandatory compliance form for executing the new provision in 403.2.2.1

Rationale

The glitch rationale for this provision meets (c) and (d). Section 403.2.2.1 provides a new mandatory requirement for duct testing or ducts in conditioned space as a result of the IECC implementation. Unfortunately, the duct testing form that has been used previously can only be found in ENERGY GAUGE USA and can only be printed when specific house details are entered into the computer program. The Florida specific need is to preserve the direct reference for a Florida specific provision (test form) that has been included with the building code since 2004. The direct reference no longer exists because ENERGY GAUGE is no longer cited directly by the building code (glitch reason c).

Further, the form from ENERGY GAUGE has a signature block for the building official. The lessons learned from the HVAC rebate program in September 2010 indicated that lawyers from many municipalities will not allow their enforcement officials to sign because the local building official represents the municipality, not the State of Florida. Further the duct test form is not found in Section 110 of the Building Code for required documents signed by the building official. Therefore, the opposing rationale contends this compounds the conflict. Thus, the proposed form 410 changes it to "received by", allowing the building official to delegate receipt to the appropriate staff person.

The unintended results (glitch reason d) is an increased cost to small businesses in terms of time, form development and form approval, in the absence of a standardize form. When doing business in a municipality that does not have access to ENERGY GAUGE and/or does not recognize the corresponding form from the software (although arguably they should), each small business could be required to come up with a unique form, but would also have additional costs of waiting for enforcement officials to approve the form. Copies of various forms from the HVAC rebate are included as evidence.

Fiscal Impact Statement**Impact to local entity relative to enforcement of code**

This modification reduces the costs to enforcement officials by providing a consistent form that indicates test method or alternative for compliance

Impact to building and property owners relative to cost of compliance with code

This will reduce the cost and liability for building owners because compliance documentation can be more easily processed by the building department

Impact to industry relative to the cost of compliance with code

There is reduced cost for compliance because it creates standardization and is included in Appendix C

Requirements**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**

Has a connection with health, safety and welfare because it closes a compliance gap

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Strengthens the code because it closes a compliance gap

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

does not discriminate because it includes both compliance paths

Does not degrade the effectiveness of the code

it increases the effectiveness of the codes because it closes a compliance gap

Add Form 410 in its entirety

FLORIDA ENERGY CONSERVATION CODE Mandatory Air Distribution System Test Report

Owner: _____	Contractor name: _____
Street address: _____	Jurisdiction: _____
City: _____	Permit No.: _____
Zip: _____	Final inspection date: _____

Ducts/air handler in conditioned space Tested by a Class 1 BERS rater (see results below)

Air Distribution System Leakage Test Results

Line	System	Duct Leakage
1	System 1	_____ Cfm25 _(out or tot) circle test type
2	System 2	_____ Cfm25 _(out or tot) circle test type
3	System 3	_____ Cfm25 _(out or tot) circle test type
4	System 4	_____ Cfm25 _(out or tot) circle test type
5		Sum lines 1-4 _____
6	<u>Total House Duct System Leakage</u>	Divide Line 5 by _____ = _____ (Qn, out or tot) (total conditioned floor area) (circle test type)

To qualify as "substantially leak free," Qn,out must be less than or equal to 0.03.

Section 403.2.2.1. Duct tightness. Duct tightness shall be verified by testing to ASHRAE Standard 152. All ducts and air handlers shall be either located in conditioned space or tested by a Class 1 BERS rater to be "substantially leak free".

Section 202. SUBSTANTIALLY LEAK FREE. Distribution system air leakage to outdoors is no greater than 3 cfm per 100 square feet of conditioned floor area at a pressure differential of 25 Pascal (0.10 in. w.c.) across the entire air distribution system, including the manufacturer's air handler enclosure.

I am a **FL BERS Class 1 Rater** in good standing. I have tested the air distribution system(s) referenced by the permit listed above in accordance with ASHRAE Standard 152.

Signature: _____ Date: _____

Printed Name: _____

FL BERS Class 1 Rater Certification #: _____

The Building Energy Rating System (BERS) law can be found at FS 553.990-999. Currently certified FL BERS Class 1 raters can be found at http://securedb.fsec.ucf.edu/engauge/engauge_search_rater.

For Building Department use only:	
Form received by: _____	Date: ____/____/____

Form revision date: March 18, 2011

6.0 Confirmed HERS Index at Time of Audit

The confirmed HERS Index for the existing home is 108.

Form FBRER-2008

Confirmed Rating

Design: Sarasota, FL
TMY: SARASOTA, BRADENTON, FL

BUILDING ENERGY RATING GUIDE

\$0 **\$2356** Reference \$2312

0 MBtu **54.8 MBtu** 54 MBtu

▼ Proposed Home

Cost Basis:
MyFloridaAverage
Florida Average
Statewide Prices

Electric Rate: \$0.120 /kWh
Gas Rate: \$2.119 /Therm
Oil: \$2.30/gal LP Gas: \$2.40/gal

Cooling	\$938
Heating	\$38
Hot Water	\$300
Cool. Fan	\$60
Dishwasher	\$21
Dryer	
Lighting	\$147
Misc.	\$478
Pumps	
Range	\$34
Refrig.	\$63
PV	

Certified Rater	1012 I.D. Number
Signature	Date

This Rating Guide is provided to you by a Home Energy Rater who is trained and certified to perform Ratings in accordance with the RESNET Standard. Questions or complaints regarding this Rating may be directed to:
EnergyGauge Program Office
1878 Clearlake Road
Cocoa, FL 32922-5703
()
energygaugerater.usf.edu

★★★★+

NOTES:
HERS Index calculated in accordance with 2008 RESNET standard, Section 303.2 (Reference home = 108, Zero energy use = 0).

10/3/2010 8:31:48 PM EnergyGauge® USA ResRate Z008AUSRZB v2.0 Page 1/1

ST

w [redacted] .com

Air Distribution System Test Report

For use when part of an Air Distribution System has been replaced (voluntary test for use with N1100.0.2)

**THE FINAL INSPECTION MUST BE APPROVED
BEFORE THIS FORM CAN BE FILED WITH THE BUILDING DEPARTMENT**
The air distribution system leakage test may be performed before or after the final inspection date.

Owner: [REDACTED]	Contractor name: [REDACTED]
Street address: [REDACTED]	Jurisdiction: _____
City: _____	Permit No.: _____
Zip: <u>33146</u>	Final inspection date: _____

Air Distribution System Leakage Test Results

Line	System	Duct Leakage
1	System 1	<u>1050</u> cfm25 (out or tot) (circle test type)
2	System 2	cfm25 (out or tot) (circle test type)
3	System 3	cfm25 (out or tot) (circle test type)
4	System 4	cfm25 (out or tot) (circle test type)
	Use appropriate calculation method	
5		Sum lines 1-4 <u>1050</u>
6	Total House Duct System Leakage When there is only one system or when all systems have been replaced	Divide by <u>928</u> = <u>1.13</u> (Qn, out or tot) (total conditioned floor area) (circle test)
OR		
7	Replacement system duct system leakage When there are multiple systems and only one or some of the systems have been replaced	Divide Line 5 by _____ = _____ % Leakage, (out or tot) (total rated air handler flow) (circle test)

I have tested the air distribution system(s) referenced by the permit listed above at a pressure differential of 25 Pascals (0.10 in. w.c.) in accordance with methods found in:

- N1110.A.2 of the Florida Building Code-Residential
- 13-610.A.2 of the Florida Building Code: Energy
- Sub-Appendix 13-2C, CS2.2.1.1 of the Florida Building Code: Energy

The replaced system is leak-free and is therefore compliant with N1100.0.2 and Form 1100B
 uses existing ductwork and is therefore compliant with N1100.0.2, exception 2

I possess the qualifications found in the selected citation to perform this work.

Signature: [REDACTED] Date: 09-10-10

Printed Name: [REDACTED]

FL BERS Rater Certification #: _____

(or) DPBR Mechanical License #: _____

(or) T&B Certification # and issuing organization or jurisdictional recognition: _____



For Building Department use only:

Form received by: _____ Date: ____/____/____

INSTALLATION CERTIFICATE		CF-GR-MECH-21-HKRS	
Duct Leakage Test - Existing Duct System			
Cover name & phone: [REDACTED]		Enforcement Agency:	Permit Number:
Address: [REDACTED]		Building & Safety	2010-055094

(Page 2 of 2)

NOTE SEALED MAIN PLENUM WITH
TAPE, MASTIC, MEMBRANE

- Outside air (OA) ducts for Central Fan Integrated (CFI) ventilation systems, shall not be sealed/taped off during duct leakage testing. CFI OA ducts that utilize controlled motorized dampers, that open only when OA ventilation is required to meet ASHRAE Standard 62.2, and close when OA ventilation is not required, may be configured to the closed position during duct leakage testing.
- All supply and return register boots must be sealed to the drywall if mastic test is utilized for compliance - applies to duct leakage compliance option 3 (leakage reduction by 60%) and option 4 (fix all accessible leaks) described above.
- New duct installations cannot utilize building cavities as plenums or platform returns in lieu of ducts.
- Mastic and draw bands must be used in combination with cloth backed rubber adhesive duct tape to seal leaks at all new duct connections.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Building and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I understand that a HERS rater will check the installation to verify compliance, and that if such checking identifies defects, I am required to take corrective action at my expense. I understand that Energy Commission and HERS provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if these installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- I will ensure that a completed, signed copy of this Installation Certificate shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy. I will ensure that all Installation Certificates will come from a HERS provider data registry for multiple orientation alternatives, and beginning October 1, 2010, for all low-rise residential buildings.

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)			
Responsible Person's Name:		Responsible Person's Signature:	
[REDACTED]		[REDACTED]	
CELB License:	Date Signed:	Position With Company (Title):	
CAC 1916043	9-10-10	OWNER / PRESIDENT	
Is this installation monitored by a Third Party Quality Control Program (TPQCP)?		Name of TPQCP (if applicable):	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			

COPY

INSTALLATION CERTIFICATE		CF-GR-MECH-21-HERS
Duct Leakage Test - Existing Duct System (Page 1 of 2)		
Owner name & phone:	Enforcement Agency:	Permit Number:
Address:	Building & Safety	2010-05509U

Enter the Duct System Name or Identification/Tag: 5 TON A/C SYSTEM SPLIT

Enter the Duct System Location or Area Served: Existing home

Note: Submit one Installation Certificate for each duct system that must demonstrate compliance in the dwelling.

This installation certificate is required for compliance for alterations and additions in existing dwellings to space conditioning systems and duct systems.

Note: For existing dwellings, a completely new or replacement duct system can also include existing parts of the original duct system (e.g., register boots, air handler, coil, plenums, etc.) if those parts are accessible and they can be sealed. For a completely new or replacement duct system installed in an existing dwelling, use the Installation Certificate titled "Duct Leakage Test - Completely New or Replacement Duct System."

Duct Leakage Diagnostic Test - Existing Duct System
Select one compliance method from the following four choices.

- Option 1. Measured leakage less than 15% of Fan Airflow.
- Option 2. Measured leakage to outside HERS min 10% of Fan Airflow.
- Option 3. Reduce leakage by 60% or more, and conduct smoke test to seal all accessible leaks.
- Option 4. Fix all accessible leaks using smoke test, and HERS rater must verify.

Note: (Option 1 must be attempted before utilizing Option 4)

Determine nominal Fan Airflow using one of the following three calculation methods.
 Cooling system method: Size of condenser in Tons 5 x 400 = 2000 CFM
 Heating system method: 21.7 x _____ Heating Output Capacity (kBtu/h) = _____ CFM
 Measured system airflow using RA3.3 airflow test procedure: _____ CFM

1	Option 1 used then: Allowed leakage = Fan Airflow <u>2000 CFM</u> x 0.15 = <u>300</u> CFM Actual leakage = <u>175</u> CFM	Pass if Actual leakage is less than Allowed leakage <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
2	Option 2 used then: Allowed leakage = Fan Airflow _____ x 0.10 = _____ CFM Actual leakage to outside = _____ CFM	Pass if Actual leakage to outside is less than Allowed leakage <input type="checkbox"/> Pass <input type="checkbox"/> Fail
3	Option 3 used then: Initial leakage prior to start of work = _____ CFM Final leakage after sealing all accessible leaks using smoke test = _____ CFM Initial leakage _____ - Final leakage _____ = Leakage reduction _____ CFM (Leakage reduction _____ / Initial leakage _____) x 100% = % Reduction	Pass if % Reduction > 60% <input type="checkbox"/> Pass <input type="checkbox"/> Fail
4	Option 4 used then: All accessible leaks repaired using smoke test. HERS rater must verify (No sampling).	Pass if all accessible leaks have been sealed using Smoke Test <input type="checkbox"/> Pass <input type="checkbox"/> Fail

COPY

Duct Leakage Flow Hood Test Report

Report Prepared For: [REDACTED]
 Prepared By: [REDACTED]
 System Description: Whole House

Date Of Test: September 20, 2010
 Living Area: 1,350 square feet on 1 Story; 2 Bedrooms; 8 ft Avg. Ceiling Height
 Duct to duct zone: 25 Pa of pressure

Flow Hood Leakage Readings				TEST	Square
				CFM:	Inches @
					25 pa
Return Leakage				0	0
Supply Leakage	12	10	8	8	7
				38	7

Total Duct Leakage Corrected to 25 Pa	38	7
New Construction Maximum Duct Leakage Standard Based On Air Conditioner Size:	60	11
Actual Leakage vs. Recommended Maximum for New Homes:	64%	
Alternative Maximum Allowable Leakage Standard Based On Living Area For All Duct Systems In Home:	41	8

COPY

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Date Submitted	3/18/2011	Section	Form 420	Proponent	Arlene Stewart
Chapter	9	Affects HVHZ	No	Attachments	Yes
TAC Recommendation	Pending Review				
Commission Action	Pending Review				
Comments					
General Comments	No	Alternate Language	No		

Related Modifications

Energy Conservation Code, section 101.4.7.1., may need a form cross reference. This is the first of 3 modifications to this section, so the mod numbers are not available.

Summary of Modification

Mod provides for uniform signed certification for the contractor to add to the air handler unit as indicated by section 101.4.7.1.

Rationale

Section 101.4.7.1 is the implementation of HB 663 into FS 553.912 (glitch reason f). The section requires a signed certification by the contractor is attached to the air handler unit stipulating that this work has been accomplished. However, the Energy Code Workgroup did not indicate a corresponding form for this provision.

The unintended consequence of this integration with the model code (glitch reason d) is that enforcement officials are likely to see a wide variety of forms, coupled with the difficulty of determining if an alternate exists because the 3 other options do not require certification. If there is no certification on the air handler, it may be because the replacement is compliant with one of the three exceptions or because the house is not compliant at all.

A consistent form will close this gap and increase ease of compliance for all involved.

This modification meets glitch reasons (d) and (f).

It is Florida specific because it completes the implementation of State legislation.

It reduces the impact to small businesses because it will create consistency in enforcement thereby reducing cost because it will reduce the likelihood of multiple compliance requirements across municipalities with no direction in code.

Fiscal Impact Statement**Impact to local entity relative to enforcement of code**

It will reduce the time (and thus cost) it takes to enforce this new provision because it creates consistency in the inspection process.

Impact to building and property owners relative to cost of compliance with code

It will reduce the cost because it will ease compliance and reduce the time enforcement officials will need review a multitude of different form formats

Impact to industry relative to the cost of compliance with code

This will reduce the cost to industry because a uniform form will be available, saving time that each company will require to make their own signed certification to meet the provision

Requirements**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**

This modification will make enforcement easier, thereby increasing the health, safety and welfare of the general public

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

It strengthens the code by including the field application for this new provision.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No, because it makes provisions for all the possibly compliance options included in the provision

Does not degrade the effectiveness of the code

No, it will increase the effectiveness of the code because it closes a compliance gap.

Add uploaded Form 420 in its entirety

Form 420

FLORIDA ENERGY CONSERVATION CODE**Duct Inspection Certification for HVAC Equipment Replacement**

[Mandatory when part of the duct and/or HVAC system has been replaced (Section 101.4.7.1.1)]

Owner: _____	Contractor name: _____
Street address: _____	Jurisdiction: _____
City: _____	Permit No.: _____
Zip: _____	Final inspection date: _____

CONTRACTOR CERTIFICATION

I certify that I have inspected the duct work associated with the HVAC unit referenced by the permit listed above and found it complies with the requirements of Section 101.4.7.1.1 as indicated below:

- Where needed, the existing ducts have been sealed using reinforced mastic or code-approved equivalent.**
- Ducts are located within conditioned space.** (Section 101.4.7.1.1 exception 1)
- The joints or seams are already sealed with fabric and mastic.** (Section 101.4.7.1.1 exception 2)
- System was tested by a FL Class 1 BERS rater (see below) and repairs were made as necessary** (Section 101.4.7.1.1 exception 3)

Signature: _____ Date: _____

Printed Name: _____

Contractor License #: _____

RATER TESTING CERTIFICATION

I certify that I have tested the replaced air distribution system(s) referenced by the permit listed above at a pressure differential of 25 Pascals (0.10 in. w.c.).

Signature: _____ Date: _____

Printed Name: _____

FL BERS Class 1 Rater Certification #: _____

The Building Energy Rating System (BERS) law can be found at FS 553.990-999. Currently certified FL BERS Class 1 raters in can be found at http://securedb.fsec.ucf.edu/engauge/engauge_search_rater.

Form revision date: March 18, 2011

Form 420

FLORIDA ENERGY CONSERVATION CODE

Duct Inspection Certification for HVAC Equipment Replacement

[Mandatory when part of the duct and/or HVAC system has been replaced (Section 101.4.7.1.1)]

Owner: _____	Contractor name: _____
Street address: _____	Jurisdiction: _____
City: _____	Permit No.: _____
Zip: _____	Final inspection date: _____

CONTRACTOR CERTIFICATION

I certify that I have inspected the duct work associated with the HVAC unit referenced by the permit listed above and found it complies with the requirements of Section 101.4.7.1.1 as indicated below:

- Where needed, the existing ducts have been sealed using reinforced mastic or code-approved equivalent.**
- Ducts are located within conditioned space.** (Section 101.4.7.1.1 exception 1)
- The joints or seams are already sealed with fabric and mastic.** (Section 101.4.7.1.1 exception 2)
- System was tested by a FL Class 1 BERS rater (see below) and repairs were made as necessary** (Section 101.4.7.1.1 exception 3)

Signature: _____ Date: _____

Printed Name: _____

Contractor License #: _____

RATER TESTING CERTIFICATION

I certify that I have tested the replaced air distribution system(s) referenced by the permit listed above at a pressure differential of 25 Pascals (0.10 in. w.c.).

Signature: _____ Date: _____

Printed Name: _____

FL BERS Class 1 Rater Certification #: _____

The Building Energy Rating System (BERS) law can be found at FS 553.990-999. Currently certified FL BERS Class 1 raters in can be found at http://securedb.fsec.ucf.edu/engauge/engauge_search_rater.

Form revision date: March 18, 2011