RHODE ISLAND
STATE BUILDING CODE

SBC-8 State Energy Conservation Code

Replaces SBC-8-2010
Effective July 1, 2013

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Administration
BUILDING CODE STANDARDS COMMITTEE
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6th EDITION

Regulation SBC-8
State Energy Conservation Code
July 1, 2013

The Building Code Standards Committee, in accordance with the rule making authority of Title 23, Chapter 23-27.3, Section 109.1, paragraphs a through c inclusive, has formally adopted and promulgated as the Rhode Island State Building Code, the provisions of the International Energy Conservation Code, 2012 edition, as published by the International Code Council, Inc. (I.C.C.), together with amendments thereto hereinafter set forth to the articles and sections of this code:

The provisions of Title 23, Chapter 27.3 of the General Laws of Rhode Island establishing administration and enforcement are hereby incorporated by reference. Regulatory Administration Chapter 1 immediately follows and is supplemental to the General Laws.

Editorial Note: Code users please note:
When purchasing or using the International Energy Conservation Code 2012 code, please take note of the particular printing edition. Errata to that printing edition is available on-line directly at no charge at *www.iccsafe.org/cs/codes/pages/errata.aspx* or call the office of the State Building Code Commissioner at 401-222-1129 for further information.

Printed copies of the administrative and enforcement provisions of Title 23, Chapter 27.3 are available at the Office of the State Building Code Commission or on-line at *http://www.rilin.state.ri.us/Statutes/TITLE23/23-27.3/INDEX.HTM*.

The International Energy Conservation Code, 2012 Edition, is protected by the copyright that has been issued to the ICC. As a result, the State Building Code is not available in complete form to the public in an electronic format. The State Energy Conservation Code 2013 edition that is referred to within is contained in a printed volume and is also in an electronic format that have been published by the ICC under an exclusive license.

The Office of the State Building Code Commissioner has purchased volumes of these codes and they shall be distributed to Rhode Island cities and towns during the month of June 2013 so that local officials will have access to the code prior to the implementation of these rules on July 1, 2013.

In order to assure public access to this code the Office of the State Building Code Commissioner shall provide a copy of this code to the Rhode Island State Library, which is located on the second floor of the State House. In addition, all codes may be viewed during business hours at the Department of Administration's Library which is located on the fourth floor of the William E. Powers Building, One Capitol Hill, Providence.

The Legislative Regulation Committee approved adoption of this code on July 1, 2013.

By:
John P. Leyden
Executive Secretary
Rhode Island Building Code Standards Committee

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The following list includes all regulations promulgated by the State Building Code Standards Committee. All regulations are available for a fee at the State Building Commission.

1.	Building Code	SBC-1-2013
2.	One and Two Family Dwelling Code	SBC-2-2013
3.	Plumbing Code	SBC-3-2013
4.	Mechanical Code	SBC-4-2013
5.	Electrical Code	SBC-5-2011
6.	Property Maintenance Code	SBC-6-2013
7.	Reserved	
8.	Energy Conservation Code	SBC-8-2013
9	Enforcement and Implementation Procedures for Projects Under the Jurisdiction of The State of Rhode Island	SBC-9
10.	Code Interpretations	SBC-10
11.	Certification of Building Officials, Building, Electrical, Plumbing and Mechanical Inspectors	SBC-11-2010
12.	New Materials and Methods of Construction	SBC-12
13.	State Building Code for Existing Schools	SBC-13
14.	Reserved	
15.	Reserved	
16.	Reserved	
17.	Public Buildings Accessibility Meeting Standards	SBC-17
18.	Native Lumber	SBC-18
19.	Fuel Gas Code	SBC-19-2013
20.	**The State of Rhode Island Rehabilitation Building and Fire Code for Existing Buildings and Structures**	**SRC-1-2002**

Format: These code changes follow numbering sequence and topics of the INTERNATIONAL ENERGY CONSERVATION CODE 2012 (first printing). All Provisions of IECC 2012 are retained unless indicated as deleted or revised. Published errata are available from the ICC website dependent on the printing issue number and date.

Chapter 1[CE]

ADMINISTRATION

Revise IECC section C101.1, Title, to read as follows:

C101.1 Title: These regulations shall be known as the State Energy Conservation Code Regulation SBC-8 - 2013 hereafter referred to as "this code".

Add the following new section C101.1.1 referenced codes.

C101.1.1 Referenced Codes. The other codes listed in Sections C101.4.1 through C101.4.6 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

1. **Electrical.** The provisions of Rhode Island State Electrical Code SBC-5-2011 shall apply wherever referenced in this code as the ICC Electrical Code, and shall apply to the installation of electrical systems, including alterations, repairs, replacement, equipment, appliances, fixtures, fittings, and appurtenances thereto.

2. **Gas.** The provisions of the Rhode Island State Fuel Gas Code SBC-19-2013 shall apply wherever referenced in this code as the International Fuel Gas Code, and shall apply to the installation of gas piping from the point of delivery, gas appliances and related accessories as covered in this code. These requirements apply to gas piping systems extending from the point of delivery to the inlet connections of appliances and the installation and operation of residential and commercial gas appliances and related accessories.

3. **Mechanical.** The provisions of the Rhode Island State Mechanical Code SBC-4-2013 shall apply wherever referenced in this code as the International Mechanical Code and shall apply to the installation, alterations, repairs and replacement of the mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.

4. **Plumbing.** The provisions of Rhode Island State Plumbing Code SBC-3-2013 shall apply wherever referenced in this code as the International Plumbing Code, and shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system.

5. **Property Maintenance.** The provisions of the Rhode Island State Property Maintenance Code SBC-6-2013 Provides requirements for continued use and maintenance buildings and property, and of related plumbing, mechanical, electrical and fire protection systems in existing
residential nonresidential structures.

6. **Fire Prevention Code.** Wherever and whenever provisions of the International Fire Code 2012 editions are referenced, the appropriate Rhode Island Fire Safety Code requirements shall apply.

7. **Building Code.** The provisions of the Rhode Island State Building Code SBC-1-2013 shall apply wherever referenced in this code as the International Building Code, and shall apply to all matters governing the design and construction of buildings.

8. **Existing Building Code.** The provisions of the State Building Codes SBC-1-2013 in conjunction with the State Rehabilitation Code SRC-1 and the Rhode Island Fire Safety Code shall apply wherever referenced in this code as the International Existing Building Code.

Any and all such references to the various International Code Council family of code shall be substituted for the appropriate state code as indicated above.

Chapter 3[CE]

Climate Zones

Delete section C301 in its entirety and substitute the following.

Section C301
Climate Zones

C301.1 General Rhode Island shall be considered as climate zone 5 with the following design conditions.

Table C301.1 Delete and substitute the following:

Table 301.1 Exterior Design Conditions.	Value	Value
Climate zone	Providence County	All others
Winter, design dry-bulb (degree F)	0	5
Summer, design dry-bulb	87	89
Summer design wet-bulb	71	73
Degree days heating	6831	5950
Degree days cooling	371	811

Delete Figure C301.1 and Substitute the following: Figure C301.1

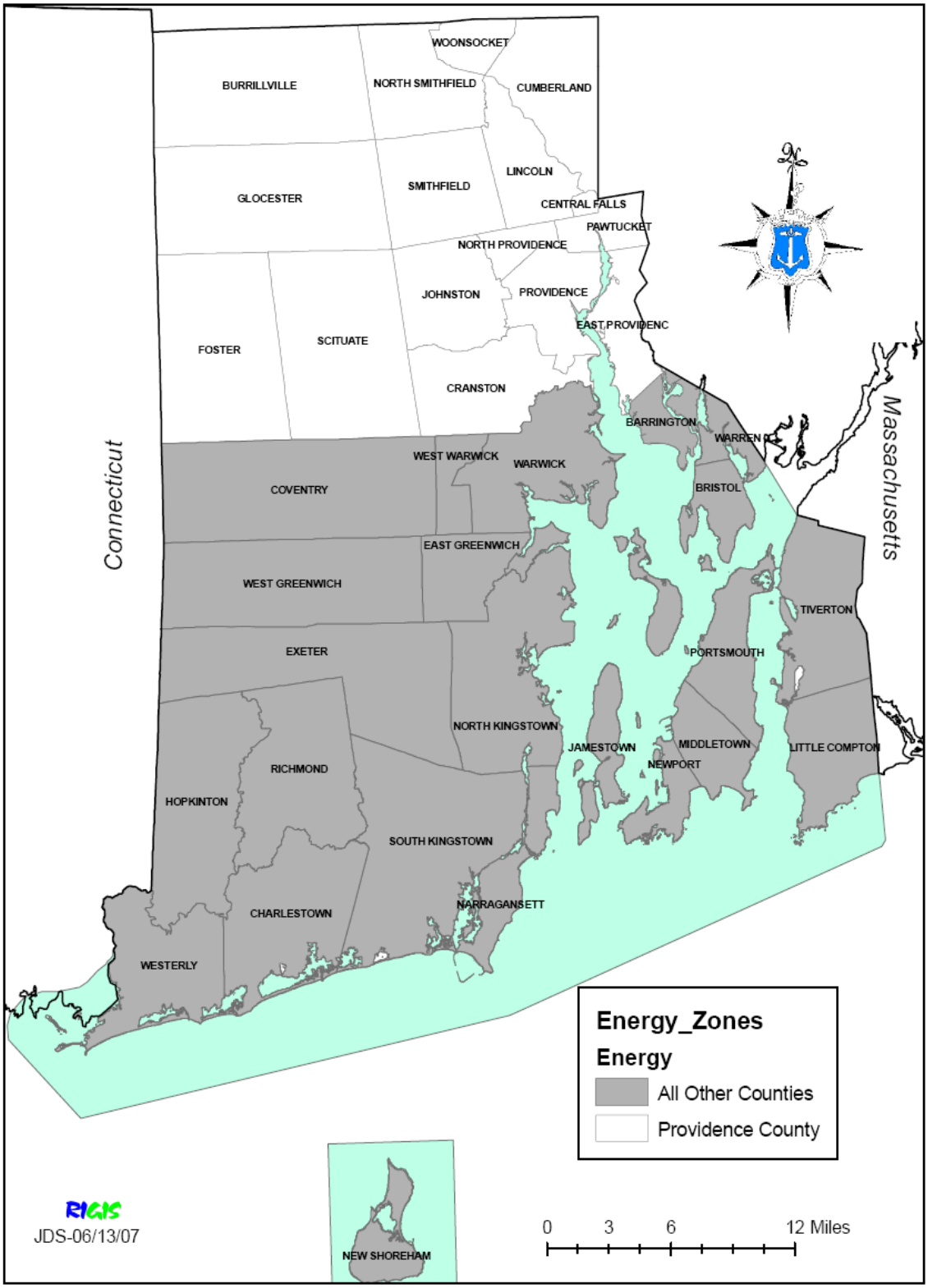

Figure 301

Delete without substitution section C301.2 and C301.3

Delete without substitution Table C301.3(1)

Delete table C301.3(2) and substitute the following

TABLE C301.3(2)
RHODE ISLAND CLIMATE ZONE DEFINITION

Zone Number	THERMAL CRITERIA	
	IP UNITS	SI UNITS
5	5400 ,HDD65^{0}F≤ 7200	3000 < HDD18^{0C} ≤ 4000

Delete C302.1 and substitute the following:

C302.1 Interior design conditions. The interior design temperature used for energy load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.

Chapter 4[CE]

Delete C401.2 Application. And add the following:

C401.2 Application. The Commercial buildings projects shall comply with the requirements in section C403 (Building Envelope Requirements), C403 (Building Mechanical Systems), C404 (Service Water Heating) and C405 (Electrical Power and Lighting Systems) in its entirety, as an alternative the commercial building project shall comply with the energy cost budget method in ASHRAE/IESNA 90.1.

Delete without substitute C401.2.1 Application to existing building.

Delete Table C402.1.2 and substitute the following

TABLE C402.1.2
OPAQUE THERMAL ENVELOPE ASSEMBLY REQUIREMENTS

CLIMATE ZONE	5	
	All other	Group R
Roofs		
Insulation entirely above deck	U-0.039	U-0.039
Metal buildings	U-0.035	U-0.035
Attic and other	U-0.027	U-00021
Walls, Above Grade		
Mass	U-0.078	U-0.78
Metal building	U-0.052	U-0.052
Metal framed	U-0.064	U-0.064
Wood framed and other	U-0.064	U-0.064
Walls, Below Grade		
Below-grade wall[a]	C-0.119	C-0.119
Floors		
Mass	U-0.074	U-0.064
Joist/Framing	U-0.033	U-0.033
Slab-on Grade Floors		
Unheated slabs	F-0.54	F-0.54
Heated slabs	F-0.58	F0.58

a. Use opaque assembly U-factors, C-factors, and F-factors from ANSI/ASHRAE/IESNA 90.1 Appendix A shall be permitted, provided the construction complies with the applicable construction details from ANSI/ASHRAE/IESNA 90.1 Appendix A.
b. When heated slabs are placed below-grade, below grade walls must meet the *F*-factor requirements for heated slabs.

Delete Table C402.2 and substitute the following

TABLE C402.2
OPAQUE THERMAL ENVELOPE REQUIREMENTS

CLIMATE ZONE	5	
	ALL OTHERS	**GROUP R**
Roofs		
Insulation entirely Above deck	R-25ci	R-25ci
Metal buildings (with R-5 thermal blocks[a,b])	R-19 + R-11LS	R-19 R-11LS
Attic and other	R-38	R-49
Walls, Above Grade		
Mass	R-11.4ci	R-13.3 ci
Metal building[b]	R-13 + R-13ci	R-13 + R-13ci
Metal framed	R-13 + R-7.5ci	R-13 + R-7.5ci
Wood framed and other	R-13 + R-3.8ci or R-20	R-13 + R-7.5ci or R-20 + R-3.8ci
Walls, Below Grade		
Below grade wall[c]	R-7.5ci	R-7.5ci
Floors		
Mass	R-10ci	R-12.5ci
Joist/framing Steel/(wood)	R-30	R-30
Slab-on-Grade Floors		
Unheated Slabs	R-10 for 24" below	R-10 for 24" below
Heated slabs	R-15 for 36" below	R-15 for 36" below
	Opaque doors	
Swinging	U –0.37	U –0.37
Roll-up or sliding	R -4.75	R -4.75

For SI: 1 inch = 25.4mm.

Ci = Continuous insulation. NR = No requirement.

a. Assembly descriptions can be found in ANSI/ASHRAE/IESNA Appendix A.
b. When using *R*-value compliance method, a thermal spacer block shall be provided, otherwise use the *U*-factor compliance method in Table C402.1.2.
c. R-5.7ci is allowed to be substituted with concrete block walls complying with ASTM C 90, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with materials having a maximum thermal conductivity of 0.44 Btu-in/h-f2 F.
d. Where heated slabs are below grade, below-grade walls shall comply with the exterior insulation requirements for heated slabs.
e. Steel floor joist systems shall be insulated to R-38.

Delete Table C402.3 and substitute the following

TABLE C402.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

CLIMATE ZONE	5
Vertical fenestration	
***U*-factor**	
Fixed fenestration	0.38
Operable fenestration	0.45
Entrance door	0.77
SHGC	
SHGC	0.40
Skylights	
U-factor	0.50
SHGC	0.40

C403.2.1 Delete and Substitute

C403.2.1 Calculation of heating and cooling loads. Design loads shall be determined in accordance with the procedures described in the ANSI/ASHRAE/ACCA Standard 183. The design loads shall account for the building envelope, lighting, ventilation and occupancy loads based on the projected design.
Heating and cooling loads shall be adjusted to account for load reductions that are achieved when energy recovery systems are utilized in the HVAC system.
Alternatively, design loads shall be determined by an *approved* equivalent computation procedure, using the design parameters specified in Chapter 3.

C403.2.4.4 Delete and substitute the following exceptions.

1. Gravity exhaust dampers shall be permitted in buildings less than three stories in height.
2. Gravity dampers shall be permitted for exhaust airflows of 300 CFM (.14 m3/s) when serving a single space.

C403.2.4.5 Delete and substitute

C403.2.4.5 Snow melt system controls. Snow and ice-melting system are allowed only when there is no increase in supplied energy consumption. As certified by Registered Design Professional. Snow- and ice- melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F (10°C) and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F (4°C) so that the potential for snow or ice accumulation is negligible.

TABLE C403.2.6
ENERGY RECOVERY REQUIREMENT

CLIMATE ZONE	PERCENT (%) OUTDOOR AIR AT FULL DESIGN AIRFLOW RATE					
	>30% AND < 40%	>40% AND <50%	>50% AND <60%	>60% AND <70%	>70% AND <80%	> 80%
	DESIGN SUPPLY FAN AIRFLOW RATE (cfm)					
5	> 5500	>4500	> 3500	> 2000	> 1000	> 0

C403.2.7 Delete and substitute

C403.2.7 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with a minimum of R-8 insulation when located in unconditioned spaces and a minimum of R-12 insulation when located outside the building. When located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation.

Exceptions:

1. When located within equipment.
2. When the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).

All ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with section 603.9 of the International Mechanical Code.

Delete Table C403.3.1(1) and substitute the following table:

Table C403.3.1(1)

Climate Zone 5-A	Economizers on all individual cooling units > 54,000 Btu/h

TABLE C403.3.1.3(1)
HIGH-LIMIT SHUTOFF CONTROL OPTION FOR AIR ECONOMIZER

CLIMATE ZONES	ALLOWED CONTROL TYPES
RI 5	Fixed dry bulb Differential dry bulb Fixed enthalpy Electronic enthalpy Differential enthalpy Dew-point and dry-bulb temperatures

a. Electronic enthalpy controllers are devices that use a combination of humidity and dry-bulb temperature in their switching algorithm.

Deleted without substitute Section C407

Chapter 5[CE]

Reference Standards

Delete without substitute

ASHRAE – 2004	ASHRAE HVAC Systems and Equipment Hand Book – 2004.

Chapter 1[RE]

ADMINISTRATION

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R101.1 Title: These regulations shall be known as the State Energy Conservation Code Regulation SBC-8 - 2013 hereafter referred to as "this code".

Add the following new section R101.1.1 referenced codes.

R101.1.1 Referenced Codes. The other codes listed in Sections R101.4.1 through R101.4.7 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

1. **Electrical.** The provisions of Rhode Island State Electrical Code SBC-5-2011 shall apply wherever referenced in this code as the ICC Electrical Code, and shall apply to the installation of electrical systems, including alterations, repairs, replacement, equipment, appliances, fixtures, fittings, and appurtenances thereto.

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3. **Mechanical.** The provisions of the Rhode Island State Mechanical Code SBC-4-2013 shall apply wherever referenced in this code as the International Mechanical Code and shall apply to the installation, alterations, repairs and replacement of the mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.

4. **Plumbing.** The provisions of Rhode Island State Plumbing Code SBC-3-2013 shall apply wherever referenced in this code as the International Plumbing Code, and shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system.

5. **Property Maintenance.** The provisions of the Rhode Island State Property Maintenance Code SBC-6-2013 Provides requirements for continued use and maintenance buildings and property, and of related plumbing, mechanical, electrical and fire protection systems in existing
residential nonresidential structures.

6. **Fire Prevention Code.** Wherever and whenever provisions of the International Fire Code 2012 editions are referenced, the appropriate Rhode Island Fire Safety Code requirements shall apply.

7. **Building Code.** The provisions of the Rhode Island State Building Code SBC-1-2013 shall apply wherever referenced in this code as the International Building Code, and shall apply to all matters governing the design and construction of buildings.

9. **Existing Building Code.** The provisions of the State Building Codes SBC-1-2013 in conjunction with the State Rehabilitation Code SRC-1 and the Rhode Island Fire Safety Code shall apply wherever referenced in this code as the International Existing Building Code.

Any and all such references to the various International Code Council family of code shall be substituted for the appropriate state code as indicated above.

Chapter 3[RE]

Climate Zones

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Section C301
Climate Zones

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Summer design wet-bulb	71	73
Degree days heating	6831	5950
Degree days cooling	371	811

Delete without substitute section R301.2 and R301.3
Delete Table R301.3(1) without substitute
Delete Table R301.3(2) without substitute

Delete Figure R301.1 and Substitute the following: Figure R301.1

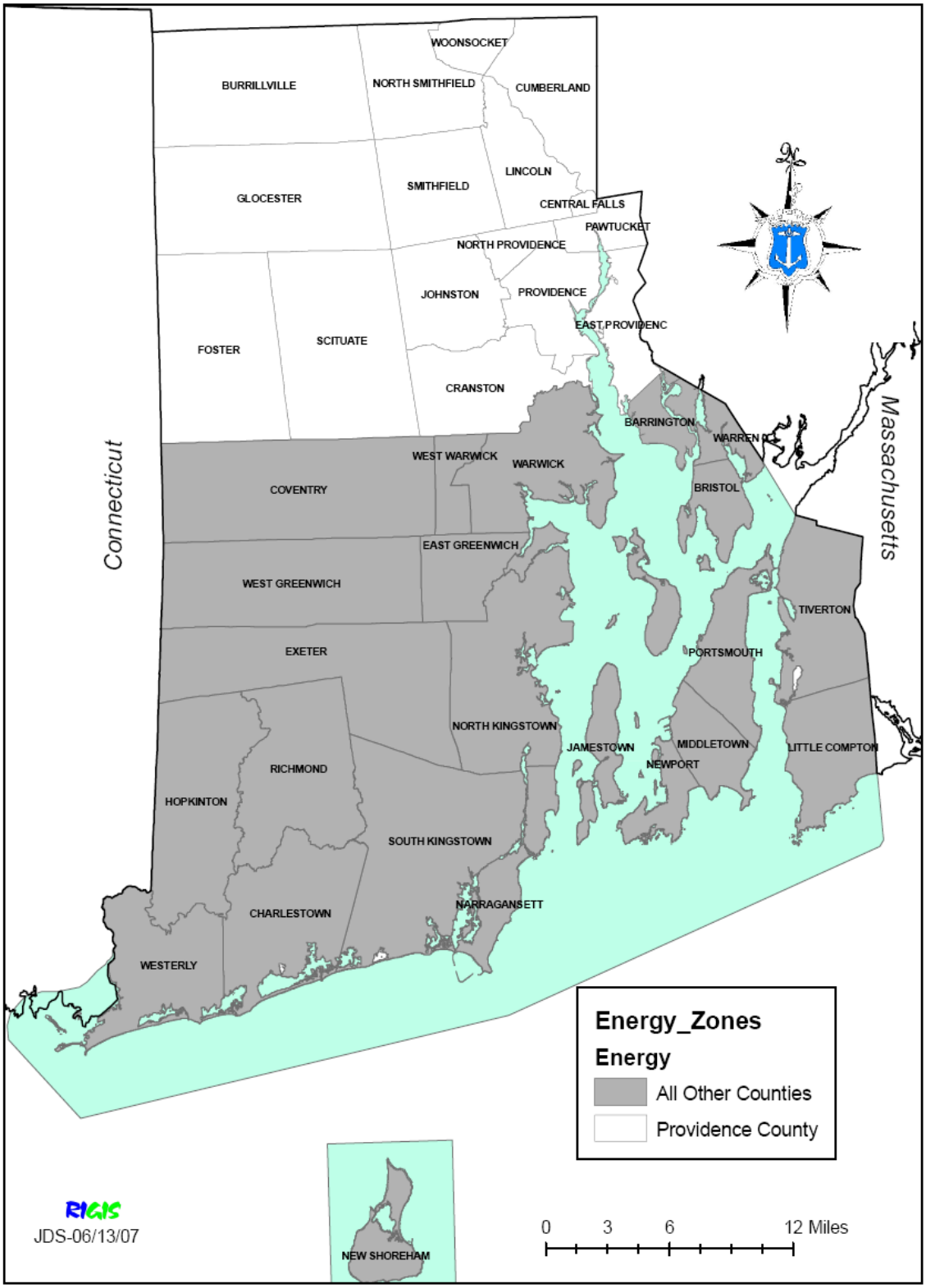

Figure 301

CHAPTER 4 [RE]

R401.2 Delete R401.2 and substitute the following:

R401.2 Compliance Methods
Compliance shall be demonstrated by either:

1. Meeting the requirements of the Rhode Island Energy Conservation Code SBC-8-2013.
2. Meeting the requirements of this chapter using the criteria for climate zone 5 from Figure N 1102A or table 1102.1.2.
3. Compliance submission of Res-Check for Zone 5 & R.I. Energy Conservation Code Residential Provisions.

Add the following to R401.3 Certificate:

Figure R401.3 A certificate similar to this shall be attached to or near the electrical panel board		
ENERGY CERTIFICATE		
Street Address		
City / Town		
Predominant Values		
R-Value Ceiling / Roof		
R- Value Walls		
R- Value Ducts (outside conditioned space)		
U Factor Fenestration		
SHGC Fenestration		
Gas Fired Un-vented Room Heater		
Baseboard Electric Heater		
Electric Furnace		
U Factor Skylight / SHGC		
AFUE Value Boiler / Furnace		
Efficiency and type of heating equipment		
Efficiency and type of cooling equipment		
Efficiency and type of service water heater		
Contractor or Design Professional		
Address		
Registration		
	Signature	

Delete and substitute Table R402.1.1

TABLE R402.1.1
INSULATION AND FENESTRATION REQUIRMENTS BY COMPONENT [a]

CLIMATE ZONE	FERNESTRATION *U*-FACTOR [b]	SKYLIGHT [b] *U*-FACTOR	GLAZED FERNESTRATION SHGC [b]	CEILING *R*-VALUE [i]	WOOD FRAME WALL *R*-VALUE [g]	MASS WALL *R*-VALUE	FLOOR *R*-VALUE	BASEMENT [C] WALL *R*-VALUE	SLAB [d] *R*-VALUE & DEBTTH	CRAWL SPACE [c] WALL *R*-VALUE
5	0.35	0.60	NR	38	20 or 13+5 [f]	13/17	30 [e]	10/13	*R*-10 for 2 ft	10/13

For SI: 1 foot = 304.8 mm.

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.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

c. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the homeor R-13 cavity insulation at the interior of the basement wall.

d. R-5 shall be added to the entire slab and the required slab edge *R*-values for heated slabs

e. Or insulation sufficient to fill the framing cavity, R-19 minimum.

f. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

g. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.

TABLE R402.1.3
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASSEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
5	0.32	0.55	0.026	0.057	0.082	0.033	0.050	0.055

R402.1.4 Total UA alternative Delete and substitute

R402.1.4 Total UA alternative. If the total *building thermal envelope* UA (sum of *U*-factor times assembly area) is less than or equal to the total UA resulting from using the *U*-factors in Table R402.1.3 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table R402.1.1. The UA calculation shall include the thermal bridge effects of framing materials. The UA calculation shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to UA compliance

R402.4.1.2 Delete and substitute the following

R402.4.1.2 Testing. The building or dwelling unit shall be tested and the air leakage rate shall be verified. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Testing shall be conducted by an *approved* third party, where required by the *building official*. A written report of the results of the test shall be signed by the party conducting the test and provided to the *building official*. Testing shall be performed at any time after creation of all penetrations of the building *thermal envelope*.
During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures;

2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures;

3. Interior doors, if installed at the time of the test, shall be open.

4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;

5. Heating and cooling systems, if installed at the time of the test, shall be turned off; and

6. Supply and return registers, if installed at the time of the test, shall be fully open.

R403.2.2 Sealing (Mandatory)

Delete From sections 403.2.2

1) Post construction test
2) Rough-in test

Substitute the following:

1. Post construction test: Total leakage shall be less than or equal to 8 cfm (113.3 L/min) per 100 square feet (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g.(25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (113.3 L/min) per 100 square feet (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the system, including the manufacturer air handler enclosure. All registers shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (85 L/min) per 100 square feet (9.29 m^2) of conditioned floor area.

Delete R403.2.3 and substitute the following

R403.2.3_ Building cavities (Mandatory). Interior building framing cavities shall be permitted to be used as return ducts or plenums. (BP)

Chapter 5[RE]

Reference Standards

Delete without substitute

ASHRAE – 2009	ASHRAE Handbook of Fundamentals.