



# RATING THE STATES: 2015

*An Assessment of Residential Building Code and Enforcement Systems  
for Life Safety and Property Protection in Hurricane-Prone Regions*

**ATLANTIC AND GULF COAST STATES  
MARCH 2015**



## The 2015 Edition

The Insurance Institute for Business & Home Safety (IBHS) is a non-profit organization, supported by property insurers and reinsurers, which conducts objective, scientific research to identify and promote effective actions that strengthen homes, businesses, and communities against natural disasters and other causes of loss. As part of this mission, IBHS identifies and promotes technical improvements to model building codes and advocates for the timely adoption and effective enforcement of these codes.

This is the second *Rating the States* report produced by IBHS. Like the original published in January 2012, and a midterm update published in August 2013, this new report evaluates and compares the quality of regulations and processes governing residential dwelling construction in the 18 states most vulnerable to catastrophic hurricanes along the Atlantic Coast and Gulf of Mexico. Each state has been assigned a score on a 100-point scale (with 100 being optimal).

This report is intended to:

- focus public attention on the need for strong statewide building codes;
- underscore the importance of code enforcement, which ensures building code technical standards actually are incorporated into construction of homes; and
- highlight steps states can take to improve their building code systems, providing better protection for their citizens and communities.

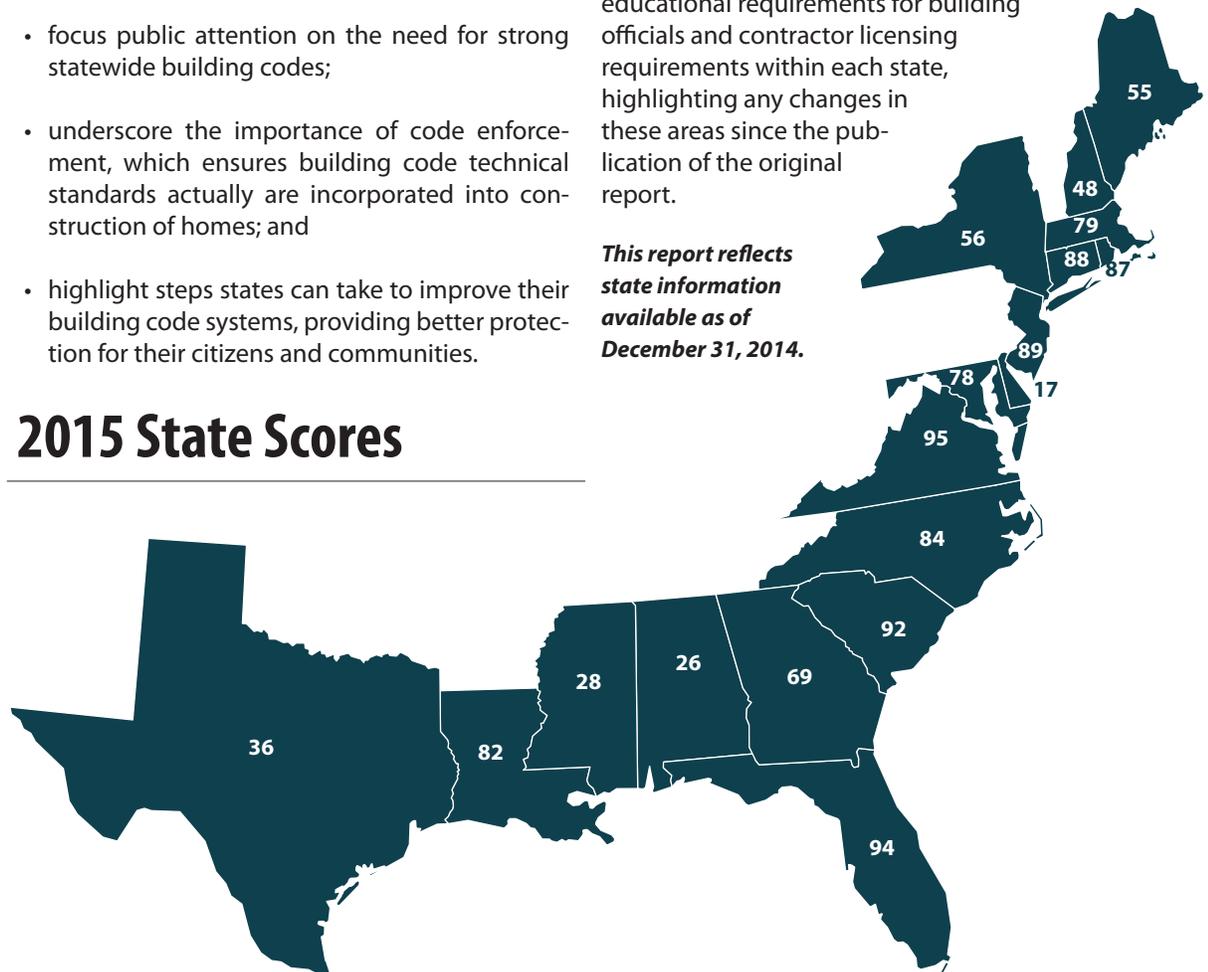
This assessment is updated frequently because the building code process in the states is not static. Ideally, states keep pace with new building science research and technology, but occasionally, they respond to political pressures that reduce or delay safety standards.

This report finds most states that had strong building code systems in place at the time of the original 2012 report remain committed to building safety; they have updated their codes to the 2012 editions of the model codes promulgated by the International Code Council (ICC), or are in the process of doing so, and have maintained effective enforcement systems. Three states—Virginia, Maryland and Mississippi—have taken excellent steps to further strengthen code protections for their residents.

Unfortunately, a number of states have taken no action to improve their code systems, and a few have weaker systems in place now than in 2012. As part of the 2015 report, IBHS also re-examined the status of certification and educational requirements for building officials and contractor licensing requirements within each state, highlighting any changes in these areas since the publication of the original report.

*This report reflects state information available as of December 31, 2014.*

## 2015 State Scores



## The Value of Building Codes

Building codes are regulatory standards designed to protect the health, safety and general welfare of the public. They also ensure the soundness of buildings and their electrical, plumbing, and mechanical systems. Building codes are intended, first and foremost, to prevent deaths and reduce injuries, as well as to reduce economic losses from a wide range of hazards. For example, a study conducted by IBHS following Hurricane Charley<sup>1</sup> in 2004, found that improvements to the codes adopted in 1996 and enforced in Florida resulted in a 60 percent reduction in residential property damage frequency (number of claims) and a 42 percent reduction in damage severity (cost of claims).

Building codes assure that minimum acceptable standards are used in the design, construction, and maintenance of buildings where people live and work. Damage reduction that results from the adoption and enforcement of building codes helps to keep people in their homes and businesses following a natural or manmade disaster, reduces the need for public and private disaster aid, and preserves natural resources and the built environment.

Additional benefits of strong, uniform, well-enforced statewide codes include:

- giving residents a sense of security about the safety and soundness of their buildings;
- offering protection to first responders during and after fires and other disaster events;
- promoting a level, predictable playing field for designers, builders, and suppliers;
- allowing for economies of scale in production and building;
- reflecting recent design and technology innovation, often incorporating newly identified best practices and cost efficiencies; and
- reducing the amount of solid waste in landfills produced by homes that are damaged or destroyed during disasters.

## Overview of the Building Code Process

While building codes apply to a wide range of buildings and address both safety and energy efficiency, the adoption and enforcement of safety codes for residential buildings is especially important because registered design professionals (such as engineers and architects) are less likely to be involved in residential design than in commercial construction. The focus of this report, therefore, is on the model building code developed by the ICC known as the *International Residential Code*<sup>®</sup> (IRC).

In the United States, building codes are adopted and enforced at the state and local levels. Rather than developing their own unique building codes from scratch, most jurisdictions base their codes on the ICC model codes, allowing for state and local amendments as appropriate (see the model codes in effect in the 18 states reviewed in this report in Appendix C). The IRC and other model codes are developed through a public, national consensus process that provides for input and participation from a wide range of stakeholders, including state and local officials, designers, builders, contractors, insurers and product manufacturers.

The IRC is updated on a three-year schedule—the most recently released version is the 2015 edition. As of December 31, 2014, the most recent IRC adopted by states and local jurisdictions is the 2012 edition.

<sup>1</sup>Hurricane Charley Report: <http://www.disastersafety.org/hurricane/hurricane-charley>

## The Importance of Resilience

Across the country there is increasing understanding that resilience is a critical part of everyone's preparedness for and response to extreme weather. This is particularly important given the high toll disasters have taken in the recent past, as well as predictions about future weather patterns that suggest a general increase in the variability of location, frequency and severity of adverse weather events.

The goal of resilience is to take actions today in order to reduce losses tomorrow. Because building

codes set the baseline for structures that are intended to last for decades, they are an important means of improving resilience. In fact, the federally issued *Hurricane Sandy Rebuilding Strategy Report* released in 2013, called on states to use the most current building codes to "ensure that buildings and other structures incorporate the latest science, advances in technology and lessons learned . . . [and] that more resilient structures are built and that communities are better protected from all types of hazards and disasters . . ."<sup>2</sup>

## Results in Brief

Although no state achieved a perfect rating based on IBHS' 100-point scale, several states again received high scores including Virginia (95 points), Florida (94 points), South Carolina (92 points), New Jersey (89 points), Connecticut (88 points), Rhode Island (87 points), North Carolina (84 points), Louisiana (82 points), Massachusetts (79 points), and Maryland (78 points). These ratings were a result of strong statewide residential building codes and regulatory processes for building officials, homebuilders and residential construction contractors.

The states that received below 70 points either have no mandatory statewide codes or have not

yet adopted the latest model residential codes, including Georgia (69 points), New York (56 points), Maine (55 points), New Hampshire (48 points), Texas (36 points), Mississippi (28 points), Alabama (26 points), and Delaware (17 points). IBHS acknowledges, however, there are jurisdictions within these states that have strong code adoption and/or enforcement programs, and many have made statewide improvements since the original *Rating the States* report. Under the "State-by-State Building Code System Assessment" section in this report, additional meaningful steps have been identified that could be implemented by these states to improve their code adoption and enforcement programs.

## Methodology and Numeric Scores

IBHS evaluated 47 data points to assess the effectiveness of the states' residential building code adoption and enforcement programs. This assessment covered important factors such as a state's current residential building code, the processes in effect to ensure universality of code application without weakening amendments, state and local level enforcement, and licensing and education of building officials, contractors, and subcontractors who implement building code provisions. A

complete description of the factors included in the model is provided in Appendix B.

This report is not intended for use in insurance underwriting or rating, or for regulatory purposes. Rather, it is intended to help provide a roadmap states can follow to improve their system of residential-related building regulations by following best practices.

<sup>2</sup>Hurricane Sandy Rebuilding Strategy Report: <http://portal.hud.gov/hudportal/documents/huddoc?id=HSRebuildingStrategy.pdf>

This report looks at state performance as a whole and provides a relative standing for each state. After identifying data points in each category, IBHS constructed a model that weighs the activities and/or processes associated with each element as follows:

- 50 percent of the total score is allotted to statewide adoption and enforcement of building codes;

- 25 percent is allotted to state-adopted requirements for building official certification, training, and continuing education; and
- 25 percent relates to state regulations for on-site implementation and proficiency, as demonstrated by contractor and subcontractor registration, licensing and continuing education.

While this numerical scoring is relatively simple, it recognizes that building codes are the focal point

## Significant Improvement

The numeric scores in the “Results in Brief” section are important in understanding how states are addressing the key components of an effective building code system: adoption and updating of mandatory statewide codes; proper enforcement of building code requirements by building officials; and the professional licensing of contractors and subcontractors who are responsible for complying with building code requirements. Beyond the changes reflected in these scores, three states deserve to be highlighted for the extraordinary work they have done to improve their building code systems since the 2012 *Rating the States* report was published.

### VIRGINIA

Virginia earned the highest score in the 2015 report due to an exemplary statewide code adoption and enforcement program. Virginia has taken steps to encourage residential fire sprinklers by providing incentives such as reduced fire access road requirements and increased fire hydrant spacing to offset the costs when residential dwellings in subdivisions are equipped with automatic fire sprinklers. Virginia’s Department of Housing and Community Development also has made specialized classes available statewide on the residential wall bracing requirements of the IRC. Additionally, the state has a code enforcement training program for residential inspectors and plan reviewers. It should be noted that every locality in Virginia’s tidewater region now requires three feet of freeboard for homes in areas designated as flood zones. Accordingly, the design flood elevation requirement in Virginia’s tidewater region is three feet above the base flood elevation. This minimum three-foot freeboard protection for flooding aligns with IBHS’ FORTIFIED for Safer Living™ program requirements.

### MARYLAND

Maryland enacted two separate laws to prevent local jurisdictions from weakening statewide building code provisions. In 2012, localities were prohibited from amending or removing automatic residential fire sprinkler requirements, and in 2013, they were prohibited from weakening state wind design and windborne debris requirements. Consequently, Maryland is the only state in this report that has adopted the 2009 IRC residential fire sprinkler requirements, making it a leader in protecting its residents, first responders, and housing stock. Strengthening the wind and windborne debris requirements is critical in a state with significant property at risk along the Atlantic coast and Chesapeake Bay.

### MISSISSIPPI

Mississippi passed landmark legislation in 2014, creating its first state building code law, following almost a decade of debate since the state was devastated by Hurricane Katrina in 2005. Prior to enactment of the new law, only seven counties were required to enforce the wind and flood requirements of the 2003 IRC—a system that ignored the multitude of weather risks and other hazards facing the entire state. Mississippi had the lowest score in IBHS’s original *Rating the States* report; passage of the new law in this highly vulnerable state improved its assessment. Additionally, although a statewide program for licensing and/or training for building officials has not yet been established, the state currently provides funding to counties and municipalities to train staff performing this function.

of an effective state regulatory life safety and property protection system. Within each of the three main model components, there are several subcategories: whether statewide building codes can be amended at the local level; certification requirements for building officials; and specific construction trades covered by licensing requirements. Points were assigned to these subcategories based on relative importance to building safety and integrity, with an emphasis on wind hazard protection requirements of the building code.

**NOTE: Appendices A and B describe the states and the model in more detail.**

States received points based on IBHS research relating to a set of questions seeking to gauge the statutory and regulatory environment in three categories and associated subcategories identified. Points were allotted when the answer to a given question is consistent with promotion of safer residential construction. No points were allotted if the answer to a given question was inconsistent with

the promotion of safer construction. No negative points were allotted.

As a result, possible scores range from 0–100, with zero being the weakest and 100 the strongest score. Actual scores ranged from 17–95. The complete list of states in order of highest to lowest scores follows. By examining the detailed assessment elements, policymakers and other interested parties can find a clear roadmap to strengthen their residential building code system and improve their standing in this report.

Since the original *Rating the States* report in 2012, some refinements were made in the data collection and approach to better reflect states' activities. The majority of these corrections were minor, and did not significantly affect the states' scores. One exception was Texas, which received additional points because its contractor licensing and plumbing code adoption were inadvertently omitted in the original report.

## 2015 and 2012 STATE SCORES

| State          | 2015 New Score | 2012 Original Report Score |
|----------------|----------------|----------------------------|
| VIRGINIA       | 95             | 95                         |
| FLORIDA        | 94             | 95                         |
| SOUTH CAROLINA | 92             | 84                         |
| NEW JERSEY     | 89             | 93                         |
| CONNECTICUT    | 88             | 81                         |
| RHODE ISLAND   | 87             | 78                         |
| NORTH CAROLINA | 84             | 81                         |
| LOUISIANA      | 82             | 73                         |
| MASSACHUSETTS  | 79             | 87                         |
| MARYLAND       | 78             | 73                         |
| GEORGIA        | 69             | 66                         |
| NEW YORK       | 56             | 60                         |
| MAINE          | 55             | 64                         |
| NEW HAMPSHIRE  | 48             | 49                         |
| TEXAS          | 36             | 18                         |
| MISSISSIPPI    | 28             | 4                          |
| ALABAMA        | 26             | 18                         |
| DELAWARE       | 17             | 17                         |

## APPENDIX A

### State-by-State Building Code System Assessments

## Virginia (95 points)

Among the 18 coastal states, Virginia is now the leader in building code safety. Virginia has incorporated the 2012 IRC requirements into its 2012 *Virginia Uniform Statewide Construction Code* (2012 Virginia Residential Code), effective July 14, 2014, with the exception of the automatic residential fire sprinkler requirement of the IRC. Virginia requires mandatory adoption and enforcement of the statewide code; however, for a one-year period, it is allowing use of the 2009 edition for projects that have already received construction permits. The *Virginia Uniform Statewide Construction Code* is consistent with the major provisions in the IRC and does not allow local amendments to the statewide code.

Virginia requires certification and training for its building officials. On-the-job training prior to sitting for examination for certification is permitted. While in training, the inspectors receive supervision; upon completion of on-the-job

training and the examination, inspectors receive the official construction trade recognition.

Virginia issues licenses for general, plumbing, mechanical, electrical and roofing contractors. However, general contractors and roofing contractors are not required to complete continuing education to renew licenses.

A mechanism for consumers to file complaints related to building code enforcement is available in Virginia. The rules permit the authority to apply disciplinary actions, which also can be applied at the local level.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 48        |
| Building official certification and training | 24        |
| Contractor licensing                         | 23        |
| <b>Total</b>                                 | <b>95</b> |

## Florida (94 points)

Florida continues to be one of the leading examples of building code safety. Since publication of the original *Rating the States* report, Florida has adopted and is enforcing the 2009 edition of the IRC. It is on schedule to adopt the 2012 IRC as its basis for the *Florida Building Code 5th Edition* (2014), with a projected effective date of June 30, 2015. The state residential code is consistent with the wind provisions in the 2012 IRC, but automatic residential fire sprinklers continue to be non-mandatory, even though required in the IRC. Florida permits local jurisdictions to adopt local amendments to make the code more restrictive than the statewide code; however, local amendments sunset every three years, except for amendments related to flood hazard areas, which do not expire.

Florida has a mandated program for building official certification and training. The program requires individuals to take code-specific courses prior to taking a certification/licensing exam, but a combination of experience and education can qualify candidates as well. The state has a one- and two-family dwelling inspector certification category, which is limited to

residential dwelling inspections.

The state requires licensing of general, plumbing, mechanical, electrical and roofing contractors. The contractor licenses require passing examinations along with continuing education in every category. Mechanisms are in place enabling the state to discipline a contractor for violations or noncompliance with the code.

The lack of requirement for continuing education of building officials specific to the residential code to maintain certification and/or a license is one area that could be improved.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 48        |
| Building official certification and training | 21        |
| Contractor licensing                         | 25        |
| <b>Total</b>                                 | <b>94</b> |

## South Carolina (92 points)

The South Carolina Building Code Council adopted the 2012 IRC with state amendments as its state residential construction code in July 2013. The *South Carolina Residential Building Code* (2012 IRC with amendments) remains consistent with the major provisions (e.g., wind and seismic) in the IRC. The requirements for automatic residential fire sprinklers have been deleted.

The state requires registration, certification and licensing for all building officials. A non-renewable two-year provisional license is issued to code enforcement officials who are undergoing training for certification required by the state. South Carolina has continuing education requirements for building officials.

With respect to contractor licensing, the state requires licensing of general, plumbing, mechani-

cal, electrical and roofing contractors, but does not mandate continuing education for renewal of licenses in any category.

Based in part on the updated code, South Carolina's score has improved during the three years since the original *Rating the States* report was published, placing it among the top three states with the best building code systems in this report. A meaningful change for the state would be to require continuing education for licensed contractors.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 48        |
| Building official certification and training | 24        |
| Contractor licensing                         | 20        |
| <b>Total</b>                                 | <b>92</b> |

## New Jersey (89 points)

New Jersey is still enforcing the 2009 IRC with state amendments, and intends to bypass the 2012 edition of the code. At some point, it intends to decide on possible adoption of the 2015 edition of the IRC with state amendments, and without the provisions for automatic residential fire sprinklers.

As one of the states recognized with a high score because of a strong building code system in the original *Rating the States* report, New Jersey's newer homes built to recent codes reportedly performed well in the face of Hurricane Sandy's winds when it hit in October 2012. However, the storm caused devastating floods and destroyed approximately 30,000 homes. The state subsequently adopted the Federal Emergency Management Agency's (FEMA) updated Advisory Base Flood Elevation maps as the rebuilding standard for the state—a change that should enhance property protection in the future, not only from coastal storm surge, but also from riverine flooding.

New Jersey has a state program for building official certification and training with continuing education requirements that is modeled after the certification program recommended by the ICC.

The state requires registration for homebuilders; however, an exam is not required for obtaining a license and there is no continuing education requirement for renewal. Similarly, registered roofing contractors are not required to take an exam, nor complete any continuing education. In contrast, the state has a good system in place for licensing and continuing education of electrical, mechanical and plumbing contractors.

New Jersey's long delay in code adoption by bypassing the 2012 IRC is an area of concern, which also affected its total points in this assessment. As a state that has had a good track record in code adoption and enforcement, New Jersey should consider regular adoption and enforcement of the model building codes. It also should require continuing education for building officials specifically dealing with the residential code in order to maintain certification and/or a license. The lack of this continuing education requirement affected the points allotted to the state.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 47        |
| Building official certification and training | 21        |
| Contractor licensing                         | 21        |
| <b>Total</b>                                 | <b>89</b> |

## Connecticut (88 points)

Connecticut adopted the 2009 edition of the IRC on February 28, 2014, without provisions for automatic residential fire sprinklers. Prior to this recent adoption, the state was using the 2003 edition of the IRC. While it adopted the 2009 IRC, the wind design criteria of the model code were deleted. Because the latest edition of wind speed maps reflected in the 2012 edition of the IRC no longer require the state to be in the wind design-required area, deleting the design criteria may conform to the 2012 edition of the code. However, the 2012 edition has more robust roof tie-down requirements, which are not covered in the 2009 edition. Accordingly, until the 2012 edition of the IRC is adopted by the state, there will be a concern that not all enhanced roof tie-down requirements are implemented in Connecticut.

The state has a program for certifying building officials. The program requires education classes prior to becoming certified as a residential code inspector.

Although Connecticut requires licensing for all construction trades, only electrical and plumbing

contractors are required to take continuing education to maintain their licenses. The state has a system for consumers to file complaints against licensed contractors and may institute disciplinary action as appropriate.

Connecticut's score has improved in this assessment primarily because of the updated building code. Considering the state is in the process of adopting the 2012 IRC with a target effective date of fall 2015, the previously noted concerns related to roof tie-downs should be alleviated once the adoption process is complete. The state also should consider requiring continuing education for building officials specifically dealing with the residential code in order to maintain certification and/or a license.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 47        |
| Building official certification and training | 21        |
| Contractor licensing                         | 20        |
| <b>Total</b>                                 | <b>88</b> |

## Rhode Island (87 points)

Since publication of the original *Rating the States* report, Rhode Island has adopted the 2012 edition of the IRC, effective July 2013, without provisions for automatic residential fire sprinklers. While upgrading to the 2012 IRC is a positive development, the state has retained deficiencies that were highlighted in the original IBHS report. Specifically, Section R301.2.1.2 of the code has been modified to allow design of partially enclosed buildings, which undermines opening protection requirements of the code. Although such a design methodology makes the structure more secure during a storm, it also increases the likelihood that wind and water could enter a home, which is a concern. The partially enclosed building design was eliminated long ago as an option in the IRC. Also, the state-published prescriptive method for high-wind design (i.e., Appendix AA of Rhode Island State Building Code; SBC-2) has several weak provisions for roof truss-to-wall connections, as well as design and anchorage of shear walls.

On a positive note, discussions have occurred about incorporating the superior construction technical standards of the IBHS FORTIFIED™ program into the state building code, but it is too early to consider that upgrade in this report.

Rhode Island has a program for building official certification and licensing and includes code-specific training courses prior to certification. The state also has requirements for continuing education of its building officials.

In Rhode Island, general contractors are required to be registered, and the state issues licenses for plumbing, mechanical and electrical contractors. However, except for electrical contractors, trades are not required to complete continuing education classes to renew licenses.

Roofing contractors are required to be registered and are governed by a licensing board.

(Rhode Island cont'd)

Considering that approximately 30 percent of Rhode Island's population is exposed to potential storms in coastal zones, a meaningful step for the state would be to eliminate the option of partially enclosed building design from the state amendments and to re-evaluate some of the recommendations in Appendix AA of SBC-2 for the high-wind design areas.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 45        |
| Building official certification and training | 23        |
| Contractor licensing                         | 19        |
| <b>Total</b>                                 | <b>87</b> |

## North Carolina (84 points)

North Carolina has adopted an amended version of the 2009 edition of the IRC and named it the 2012 *North Carolina State Building Code*. This code does not include provisions for automatic residential fire sprinklers.

Furthermore, future adoption of the IRC on a timely basis is very much in doubt, because of state-enacted legislation in 2013 which changes the adoption cycle of the model code from every three years to six years. As a result, the North Carolina Building Code Council does not intend to update the statewide residential building code until 2018, which would mean the code will be based on a nine-year-old model. The North Carolina Building Code Council also has approved weakening of the wall bracing provisions in coastal hurricane-prone regions, by allowing lower wind speed bracing requirements to be used in higher wind regions than intended by the model code. Also, the Council approved the elimination of permanent anchors installed around glazed openings (e.g., windows), making it less likely that opening protections will be adequately anchored in coastal windborne debris regions of the state.

The state has a program for building official certification/licensing and includes code-specific training courses prior to certification with continuing education requirements.

Licenses are required for general contractors, as well as plumbing, mechanical and electrical contractors in North Carolina. However, except for electrical contractors, trades are not required to complete continuing education classes to renew licenses. There are no licensing requirements for roofing contractors.

North Carolina's legislative and regulatory actions to weaken building code protection requirements during the past few years are a major concern. Clearly, much effort needs to be spent on reinstating the regular updates of the state residential code; otherwise the state will fall behind on safety improvements that are incorporated in every edition of the ICC model code. The weaknesses resulting from outdated or weakened building codes will become apparent only at the moment when resistance is most needed—when a hurricane or other disaster strikes. Other meaningful changes the state should take include requiring continuing education for plumbing and mechanical contractors, as well as instituting licensing requirements for roofing contractors.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 44        |
| Building official certification and training | 23        |
| Contractor licensing                         | 17        |
| <b>Total</b>                                 | <b>84</b> |

## Louisiana (82 points)

Since publication of the original *Rating the States* report, Louisiana adopted the 2012 edition of the IRC, without provisions for automatic residential fire sprinklers. Unfortunately, Louisiana took a step backward in 2013, with the approval of an Emergency

Declaration by the State Code Council, which adopted the 2012 editions of the IRC design wind speed maps without the new trigger for following high-wind design requirements. By adopting the new design wind speed maps without the maps

(Louisiana cont'd)

delineating high-wind design or windborne debris regions, the state created a deficiency in protecting residential dwellings in areas subject to high winds.

Louisiana has a state program that requires building official certification; however, no mandatory code education classes are included in the certification process.

The state requires licensing of general, plumbing, mechanical, electrical and roofing contractors, with continuing education for renewal of licenses for general contractors and plumbing contractors. The electrical, mechanical and roofing contractors are

not required to take continuing education classes.

Louisiana's score in the area of contractor licensing has improved; however, the state should fix the deficiency created by the 2013 Emergency Declaration in regard to the windborne debris protection requirements of the code.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 46        |
| Building official certification and training | 14        |
| Contractor licensing                         | 22        |
| <b>Total</b>                                 | <b>82</b> |

## Massachusetts (79 points)

As was the case when the original *Rating the States* report was published, Massachusetts is currently enforcing the 2009 edition of the IRC, without provisions for automatic residential fire sprinklers. Massachusetts bypassed adoption of the 2012 IRC and intends to adopt the 2015 edition of the code at some point. As noted in the original report, several Massachusetts amendments have weakened important wind provisions of the IRC. These are mainly related to code-specified wind speed and exposure categories that trigger high-wind design requirements.

Although there is a program for building official certification, it does not require individuals to complete code-specified classes prior to the certification exam. Also, the state does not require a continuing education program specifically related to the residential dwelling code.

Massachusetts requires licensing of general, plumbing, electrical and roofing contractors along with continuing education requirements. However, no licensing is required to perform heating, ventilation and air conditioning work for lower than ten ton units. These smaller units are almost always

used in one- and two-family dwellings subject to the IRC requirements.

The state's delay in code adoption by bypassing the 2012 edition is an area of concern, which led to a loss of points in this assessment. With a long track record in code adoption and enforcement and as a leading advocate in public safety, the Massachusetts' Board of Building Regulations and Standards is encouraged to reinstitute regular adoption of the model codes. Other factors affecting Massachusetts' overall score are the lack of requirements for code-specific training classes for building officials to obtain certification, and continuing education training classes for residential code recertification.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 46        |
| Building official certification and training | 13        |
| Contractor licensing                         | 20        |
| <b>Total</b>                                 | <b>79</b> |

## Maryland (78 points)

Maryland has adopted the 2012 edition of the IRC as part of *Maryland Building Performance Standards*, which are enforced statewide. Local jurisdictions may modify provisions of the standard, however, through amendment to address conditions specific to the local jurisdiction's community. In very positive developments, two important legislative actions in 2012 and 2013, now prohibit local jurisdictions from amending or removing the automatic residential fire sprinkler requirement in the code, or weakening statewide wind design and windborne debris requirements. Among the 18 coastal states evaluated in this report, Maryland is the only one with automatic residential fire sprinkler requirements for new residential dwellings.

Maryland does not license inspectors separately for residential construction, or require completion of code training classes prior to certification. It also does not have a mechanism for the public to file complaints against inspectors.

The state requires licensing of general, plumbing, mechanical, electrical and roofing contractors with continuing education required only for electrical contractors.

While the Maryland Office of Code Administration provides a voluntary training program for building officials throughout the state, mandating certification and licensing for residential inspectors would further reinforce Maryland's commitment to an even stronger building and safety code program. Such a program would improve the capabilities of the code enforcement personnel, improve the uniformity of enforcement, and help elevate their recognition as professionals throughout the state.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 43        |
| Building official certification and training | 15        |
| Contractor licensing                         | 20        |
| <b>Total</b>                                 | <b>78</b> |

## Georgia (69 points)

Since the original *Rating the States* report, Georgia has adopted the 2012 edition of the IRC as its mandatory code, if local jurisdictions decide to enforce a residential code. The Georgia amendments to the 2012 IRC are consistent with the major provisions in the model code, except that the requirements for automatic residential fire sprinklers are optional in new one- and two-family dwellings and townhouses.

Georgia has a program for certification of building officials, but does not require code classes prior to certification. Their program requires continuing education; but there is no mechanism for taking disciplinary action against an inspector by the state.

General contractors, plumbing, mechanical and electrical contractors are required to be licensed in Georgia. Exams and continuing education are a part of licensing programs. There are no licensing requirements for roofing contractors.

To strengthen its building code system, Georgia should make adoption and enforcement of the statewide code by all jurisdiction throughout the state mandatory.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 33        |
| Building official certification and training | 16        |
| Contractor licensing                         | 20        |
| <b>Total</b>                                 | <b>69</b> |

## New York (56 points)

With the exception of New York City, the 2010 Residential Code of New York State is enforced throughout the state. This code is based on the 2006 edition of the IRC. The current state residential code has weakening provisions such as allowing residential buildings in windborne debris regions to be designed as partially enclosed buildings, instead of requiring opening protection. This undermines opening protection requirements in the IRC. On a positive note, New York State's Fire Prevention and Building Code Council voted in October 2014 to update the statewide residential code to the 2015 edition of the IRC, and has begun the adoption process. As a result of Hurricane Sandy, New York State also increased design flood elevation requirements to two feet above base flood elevation. This will reduce the vulnerability of coastal properties to flooding or storm surge damage.

The New York City building regulatory system remains exempt from the New York State requirements. In the aftermath of Hurricane Sandy, the New York City Council took a major positive step in updating and strengthening their building codes, especially for wind resistance. The amendments approved by the City Council will bring the *New York City Building Code* in line with the 2009 edition of the ICC codes, effective October 1, 2014.

New York State has a mandated program for certification of building officials including code classes prior to certification. However, its program does not require

that the continuing education courses be on the residential code.

The state does not require licensing of general, plumbing, mechanical, electrical or roofing contractors, and leaves the decision up to local jurisdictions whether to require regulations for licensing of construction trade contractors.

The state of New York's long delay in code adoption is an area of concern. Considering the model residential code is updated every three years, the state should consider regular adoption and enforcement of the IRC. Also, New York should consider adopting a state-mandated certification and licensing program for construction trade contractors.

The state's overall score was negatively affected by not having updated codes, and not requiring continuing education courses be based on the residential code. The state also lost points for not having a state-mandated certification and licensing program for trade contractors.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 36        |
| Building official certification and training | 20        |
| Contractor licensing                         | 0         |
| <b>Total</b>                                 | <b>56</b> |

## Maine (55 points)

Maine has not updated its state residential building code since the publication of the original *Rating the States* report, and is currently enforcing the 2009 edition of the IRC, without provisions for automatic residential fire sprinklers. A major weakness in the state regulations, identified in the original *Rating the States* report, allows municipalities with fewer than 4,000 people to choose not to have or enforce a building code.

Maine has a program for certifying building officials, but does not require code-specific education courses prior to certification. The state requires continuing education, but it is a minimal requirement of nine hours every six years. The state has a certification category for residential construction inspectors, but there is no process for filing com-

plaints or disciplinary action against inspectors.

The state requires licensing for plumbing and electrical contractors, but not for other trades. Plumbing and electrical contractors are required to take an exam prior to licensing and they are subject to disciplinary action. Electrical contractors are required to obtain continuing education for license renewal.

The Maine Bureau of Building Codes and Standards and the state legislature should consider revising regulations to require all municipalities throughout the state, regardless of the size of their population, to adopt and enforce the Maine Uniform Building Code.

(Maine cont'd)

The state's score also was affected by not having the most updated code, not requiring building officials to complete code-specific education courses prior to certification, and not having a mechanism for consumers to file complaints against inspectors.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 32        |
| Building official certification and training | 14        |
| Contractor licensing                         | 9         |
| <b>Total</b>                                 | <b>55</b> |

## New Hampshire (48 points)

New Hampshire has a single statewide residential code based on the 2009 edition of the IRC; however, it does not require mandatory enforcement at the local level. The requirement for automatic residential fire sprinklers has been deleted.

New Hampshire has no statewide program to license building officials. In 2014, the state considered legislation to establish a board of building officials for certification and regulation of persons enforcing the state building code and conducting building inspections. The bill was referred for interim study, and is still pending as this report goes to publication.

Contractor licensing is required for plumbing and electrical contractors, but not for other trades. Plumbing and electrical contractors are required to

take an exam prior to licensing, are subject to disciplinary action, and are required to take continuing education classes.

New Hampshire should consider mandatory enforcement of the statewide residential code and continue with efforts to establish a building official certification and licensing program throughout the state. The state's score also was affected because it has not adopted the latest edition of the code.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 38        |
| Building official certification and training | 0         |
| Contractor licensing                         | 10        |
| <b>Total</b>                                 | <b>48</b> |

## Texas (36 points)

Texas does not require mandatory adoption and enforcement of its residential building code throughout the state. However, municipalities may adopt and enforce the 2006 IRC as a minimum residential construction code. The Texas Department of Insurance has adopted windstorm building code standards, but they are voluntary requirements that homeowners must meet for the purpose of obtaining windstorm and hail insurance from the Texas Windstorm Insurance Association (TWIA), the state wind catastrophe pool.

The State Board of Plumbing Examiners recently revised the Texas Administrative Code and adopted the 2012 *Uniform Plumbing Code* (UPC) and the plumbing chapter in the 2012 IRC.

Texas has no statewide program to license building officials.

Compared to the previous evaluation, Texas gained a substantial number of points for its contractor licensing programs.<sup>3</sup> The state requires licensing for plumbing, mechanical and electrical contractors. Plumbing and electrical contractors are required to take continuing education classes for license renewal.

Past events have demonstrated that Texas is vulnerable to a wide range of natural disasters including wildfires, hurricanes and strong windstorms. Adoption of a modern statewide code system throughout the state would help establish uniformity in enforcement and application of the code provisions, and reduce losses in the event of catastrophic events.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 22        |
| Building official certification and training | 0         |
| Contractor licensing                         | 14        |
| <b>Total</b>                                 | <b>36</b> |

<sup>3</sup>See note under Methodology and Numeric Scores section (p.7).

## Mississippi (28 points)

After years of considering and rejecting legislation to establish a statewide building code, Mississippi took a huge step forward in 2014 by adopting a building code law that governs construction of most residential buildings in the state. The law, which allowed municipalities to adopt one of the last three effective IRC code editions, became effective August 1, 2014. However, it allowed municipalities to opt out of the requirements for adoption and enforcement within 120 days of the effective date (November 30, 2014).

Based on data available to IBHS as of December 31, 2014, it appears that approximately 90 percent of the population within Mississippi's municipalities lives in areas that have not opted out of the new building code law. However, approximately 50 percent of the state's population lives in unincorporated areas, which are governed by the respective county board of supervisors. Data associated with these unincorporated areas was not available to IBHS by the report deadline, so it was not possible to fully determine what percentage of the state's population will be covered by a building code. IBHS will continue to monitor this issue and review outcomes in future *Rating the States* reports.

Mississippi has not yet established a statewide program for licensing or training of building officials, although funding for training through local governments is provided by the state.

General contractors are the only trade required to obtain a license and the state has mechanisms to register complaints from the public and discipline contractors.

While the Mississippi state building code law is a major advancement, the opt-out provision reduced the overall effectiveness of the code adoption process and its uniformity throughout the state. The state also should consider further enhancements of the rule by requiring a statewide program for training and licensing of building officials.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 24        |
| Building official certification and training | 0         |
| Contractor licensing                         | 4         |
| <b>Total</b>                                 | <b>28</b> |

## Alabama (26 points)

Effective October 1, 2012, Alabama adopted the *Alabama Energy and Residential Codes* (AERC) for all jurisdictions statewide. The AERC is comprised of the 2009 *International Energy Conservation Code*® (IECC) and the 2009 IRC. Although the energy portion of the code is mandatory at the local level, local jurisdictions are permitted to continue enforcing different editions of residential building codes. However, the law requires that if jurisdictions have not previously adopted a residential building code and decide to adopt one, they must now adopt the AERC codes. It should be noted that enforcement aspects of the AERC are not clearly defined in the rule and/or can be considered non-existent. IBHS is aware that several coastal communities within the state have strong code adoption and enforcement programs.

Alabama has no statewide program to license building officials.

The state requires licensing for general, plumbing, mechanical and electrical contractors, but not for roofing contractors. Mechanical and electrical contractors are required to obtain continuing education for license renewal.

Alabama has experienced devastating coastal hurricanes and inland tornadoes. Adoption of a modern mandatory statewide residential code throughout the state will help establish uniformity in enforcement and application of the important code provisions. It also will reduce losses to life and property in the event of severe storms, to which the state is highly vulnerable.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 8         |
| Building official certification and training | 0         |
| Contractor licensing                         | 18        |
| <b>Total</b>                                 | <b>26</b> |

## Delaware (17 points)

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As noted in the original *Rating the States* report, Delaware does not have a statewide residential building code, except for a plumbing code, which is based on the 2012 edition of the *International Plumbing Code*® (IPC). There has been no progress toward adoption of a statewide code in the state since the original report's publication.

The state has no statewide program to license building officials.

Delaware requires licensing for plumbing, mechanical and electrical contractors, while general contractors and roofing contractors are not licensed. Electrical contractors are required to obtain continuing education for license renewal.

Delaware should consider adoption and enforcement of a model statewide residential code system throughout the state and a program to license building officials and contractors.

| Assessment Category                          | Points    |
|--|-----------|
| Code adoption and enforcement                | 4         |
| Building official certification and training | 0         |
| Contractor licensing                         | 13        |
| <b>Total</b>                                 | <b>17</b> |

# APPENDIX B

## Assessment Criteria for Rating the States Report (Residential Building Code)

### PART 1 – STATE CODE ADOPTION AND ENFORCEMENT

#### 1. STATEWIDE CODE ADOPTION

- a) Do the statutes of the state require adoption of a mandatory statewide residential code?  
*(10 points if yes)*
- b) Do the statutes adopt a residential code, but adoption by local jurisdictions is not mandatory, or code doesn't apply throughout the state?  
*(4 points if yes)*
- c) Is there no statewide code? (Meaning local government can use any code they choose.)  
*(0 points if yes)*

*Each state must fall into only one of the categories 1a–1c, so yes to 1a represents the maximum points for this set of questions.*

#### 2. ENFORCEMENT

Do the state statutes require mandatory enforcement?  
*(10 points if yes)*

#### 3. UPDATED CODES

What edition of the International Residential Code (IRC) does the state use?  
*(5 points for 2012 IRC; 4 points for 2009 IRC; 3 points for 2006 IRC; and 0 points if older than 2006, or no code is adopted)*

#### 4. WIND PROVISIONS

- a) Do the provisions of the code meet the requirements of the IRC/ASCE 7 for opening protection? (IRC Section R301.2.1.2)  
*(2 points if yes)*
- b) Does the code require roof coverings to meet the provisions of ASTM D7158?  
*(2 points if ASTM D7158 is adopted; 0 points if*

*it is not adopted).*

*IRC Section R905.2.4.1—2006 edition references ASTM D3161, while 2009 and 2012 editions reference both ASTM D3161 and D7158.*

- c) Does the code require that windows and doors (dwelling and garage) meet pressure ratings as provided in the IRC? (IRC Section R612.2 [R612.5 in the 2009 edition] Table R301.2(2) and Section R301.2.1.)  
*(1 point if yes)*
- d) Does the code require exterior wall covers (siding) to be wind rated? (IRC Sections R703.1.2 and R703.4 of 2006 through 2012 editions.)  
*(1 point if yes)*
- e) **Part I)** In areas where wind speeds equal or exceed 100 mph per IRC (2006 and 2009 or wind design required in 2012) and ASCE 7 maps, does the code direct users to the requirements of one of the following standards (IRC Section R301.2.1.1):
  - American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual for One- and Two-Family Dwellings* (WFCM);
  - International Code Council (ICC) *Standard for Residential Construction in High Wind Regions* (ICC-600);
  - *Minimum Design Loads for Buildings and Other Structures* (ASCE 7);
  - American Iron and Steel Institute (AISI) *Standard for Cold-Formed Steel Framing – Prescriptive Method for One- and Two-Family Dwellings* (AISI S230);
  - Concrete construction (i.e., insulated concrete forms or ICFs) shall be designed in accordance with the provisions of this code (IRC Section R611.2 limits ICFs to 130 mph in Exposure B, 110 mph in Exposure C and 100 mph in Exposure D); or

- Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code (IRC Section R613.2 limits SIPs to 120 mph in Exposure A and B and 110 mph in Exposure C).

e. **Part II)** For states that have adopted the 2012 IRC, are the following required:

- Roof rafters are attached in accordance with Table R602.3(1); and
- Compliance with Table R802.11 for roof tie-downs (i.e., adoption and enforcement of the table without amendment).

*(1 point if yes and both Parts I and II conform to the code)*

f) Are the requirements for strapping/load path and bracing in the state code consistent with any of the standards referenced in the IRC for:

- Strapping/load path
- Sheathing attachment (roofs)
- Wall bracing

*(1 point if a, b and c are in conformance)*

#### 5. FIRE SPRINKLERS

Does the code mandate automatic residential fire sprinklers (IRC Section R313)?

*(1 point if yes)*

#### 6. OTHER WEAKENING AMENDMENTS

Other than wind provisions or automatic fire sprinklers, has the state adopted other weakening amendments to the residential code?

*(1 point if no)*

#### 7. LOCAL AMENDMENTS

a) Are weakening amendments allowed by local jurisdictions?

*(5 points if no)*

b) Are local technical amendments required to be approved by a state administrative body?

*(2 points if yes, treated as yes if local weakening amendments are not permitted)*

#### 8. PLUMBING CODES

Has the state adopted a plumbing code?

*(4 points if yes)*

#### 9. ELECTRICAL CODES

Has the state adopted an electrical code?

*(4 points if yes)*

### PART 2 – CERTIFICATION AND EDUCATION OF BUILDING OFFICIALS (RESIDENTIAL CONSTRUCTION)

10. **Does the state have a mandatory program for building officials for certification/licensing?**

*(7 points if yes)*

11. **Does the building certification/licensing program require individuals to complete code-specific education classes before they can take the exam?**

*(6 points if yes)*

#### 12. BUILDING OFFICIAL CERTIFICATION

a) Does the state require that, before employment, building officials receive certification in the field in which they will work?

b) If no, is the certification required within a fixed time period?

c) What is the time period?

*(For 12a–12c, a range of points is possible based on the timeframe in which building officials receive certification: 4 points if certification is required upon employment [12a is yes]; 3 points if certification is required within 2 years of employment [12a is no, 12b is yes, and 12c is equal to or less than 24 months]; 2 points if the deadline for certification is more than 2 years after employment [12a is no, 12b is yes, and 12c is greater than 24 months]; and 0 points if there is no certification requirement)*

**13. Building Official Continuing Education (CE)**

- a) Does the certification/licensing program require CE regarding the residential code?  
*(3 points if yes)*
- b) If the certification/licensing program requires CE, what is the interval for recertification?  
*(1 point if less than or equal to 2 years)*
- c) If CE is required to maintain certification/licensing, how many hours are required?  
*(1 point if the average required number of CE hours [the hours in CE divided by the certification interval] is equal to or greater than 5; the minimum for scoring is 5 hours per year [standard based on the ICC CE model of 15 hours every 3 years])*

**14. Does the state license inspectors separately for residential construction?**

*(1 point if yes)*

**15. Does the state have a mechanism for consumers to file complaints and does a board have the authority to discipline inspectors?**

*(2 points if yes)*

**PART 3 – LICENSING OF CONTRACTORS AND SUBCONTRACTORS**

**16. RESIDENTIAL/GENERAL CONTRACTORS**

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- a) Do the statutes mandate licensing/registration of residential/general contractors?  
*(2 points if yes)*
- b) Do applicants take a test to prove minimum competency?  
*(1 point if yes)*
- c) Do consumers have a mechanism to file complaints and does the licensing board have authority to discipline licensees?  
*(1 point if yes)*
- d) Does licensing require continuing education?  
*(1 point if yes)*

**17. PLUMBING CONTRACTORS**

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- a) Do the statutes mandate licensing/registration of plumbing contractors?  
*(2 points if yes)*
- b) Do applicants take a test to prove minimum competency?  
*(1 point if yes)*
- c) Do consumers have a mechanism to file complaints and does the licensing board have authority to discipline licensees?  
*(1 point if yes)*
- d) Does licensing require continuing education?  
*(1 point if yes)*

**18. MECHANICAL CONTRACTORS**

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- a) Do the statutes mandate licensing/registration of mechanical contractors?  
*(2 points if yes)*
- b) Do applicants take a test to prove minimum competency?  
*(1 point if yes)*
- c) Do consumers have a mechanism to file complaints and does the licensing board have authority to discipline licensees?  
*(1 point if yes)*
- d) Does licensing require continuing education?  
*(1 point if yes)*

**19. ELECTRICAL CONTRACTORS**

---

- a) Do the statutes mandate licensing/registration of electrical contractors?  
*(2 points if yes)*
- b) Do applicants take a test to prove minimum competency?  
*(1 point if yes)*

- c) Do consumers have a mechanism to file complaints and does the licensing board have authority to discipline licensees?

*(1 point if yes)*

- d) Does licensing require continuing education?

*(1 point if yes)*

## **20. ROOFING CONTRACTORS**

---

- a) Do the statutes mandate licensing/registration of roofing contractors?

*(2 points if yes)*

- b) Do applicants take a test to prove minimum competency?

*(1 point if yes)*

- c) Do consumers have a mechanism to file complaints and does the licensing board have authority to discipline licensees?

*(1 point if yes)*

- d) Does licensing require continuing education?

*(1 point if yes)*

# APPENDIX C

## *Residential Codes in Effect for States in Rating the States Report*

|                       |  |
|-----------------------|--|
| <b>VIRGINIA</b>       | 2012 <i>International Residential Code</i> ® with state amendments.  |
| <b>FLORIDA</b>        | 2009 <i>International Residential Code</i> ® with state amendments.  |
| <b>SOUTH CAROLINA</b> | 2012 <i>International Residential Code</i> ® with state amendments.  |
| <b>NEW JERSEY</b>     | 2009 <i>International Residential Code</i> ® with state amendments.  |
| <b>CONNECTICUT</b>    | 2009 <i>International Residential Code</i> ® with state amendments.  |
| <b>RHODE ISLAND</b>   | 2012 <i>International Residential Code</i> ® with state amendments.  |
| <b>NORTH CAROLINA</b> | 2009 <i>International Residential Code</i> ® with state amendments.  |
| <b>LOUISIANA</b>      | 2012 <i>International Residential Code</i> ® with state amendments.  |
| <b>MASSACHUSETTS</b>  | 2009 <i>International Residential Code</i> ® with state amendments.  |
| <b>MARYLAND</b>       | 2012 <i>International Residential Code</i> ® with state amendments.  |
| <b>GEORGIA</b>        | No mandatory code. The 2012 <i>International Residential Code</i> ® with state amendments permitted, if a code is to be adopted at a local level.  |
| <b>NEW YORK</b>       | The 2006 <i>International Residential Code</i> ® with state amendments, except New York City which adopted 2009 <i>International Building Code</i> ® with residential construction provisions. |
| <b>MAINE</b>          | 2009 <i>International Residential Code</i> ® with state amendments. Municipalities with populations less than 4,000 may opt out.   |
| <b>NEW HAMPSHIRE</b>  | The 2009 <i>International Residential Code</i> ® with state amendments, but local enforcement is not mandatory.  |
| <b>TEXAS</b>          | No mandatory code. The 2006 <i>International Residential Code</i> ® is optional.   |
| <b>MISSISSIPPI</b>    | One of the last three editions of the <i>International Residential Code</i> ®. A number of counties and municipalities within the state have opted out.  |
| <b>ALABAMA</b>        | No mandatory code. The 2009 <i>International Residential Code</i> ®, if a code is to be adopted at local level.  |
| <b>DELAWARE</b>       | No mandatory residential code.   |

