Texas State Collaborative

Established 2012

City of Austin/Travis County

Leadership Toolkit

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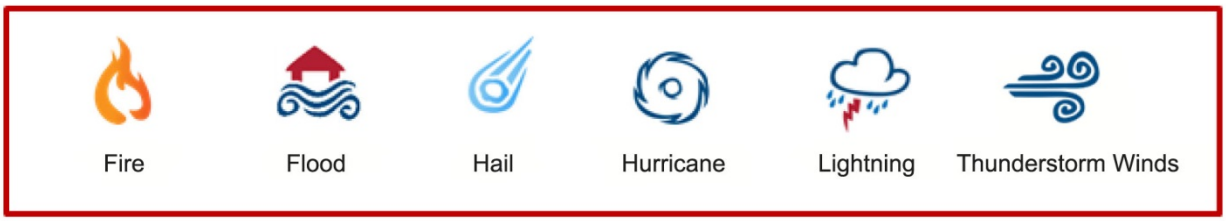
TOOLKIT LEGEND



Introduction

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Texas leaders play an important role in fostering communities that are resilient against damage from natural disasters. Residents of resilient communities are better prepared for severe weather events and experience multiple benefits from strong building codes and practices. Benefits include safe, strong and sustainable homes and businesses, a more stable local economy, and fewer burdens and disruptions in the delivery of emergency services.

The Texas State Collaborative (TSC) is a private-public collaboration that was formed in 2012 to address the most pressing issues affecting Texas' built environment. Stakeholders from leading insurers, reinsurers, design/build associations, building code officials, emergency managers, meteorologists, and state and local government officials make up the collaborative.

The TSC supports three key building blocks in support of disaster-resilient communities:

- Increase public safety through enhanced awareness of Texas weather risks
- Modern strong state and local building codes
- Consistent and effective enforcement of state and local building codes by trained professionals

To that end, the Federal Alliance for Safe Homes (FLASH)® created the *Texas Leadership Toolkit* for the TSC to raise awareness of weather perils specific to City of Austin/Travis County and to help spotlight what residential building code is in effect and what that means with respect to life safety for City of Austin/Travis County.

Stakeholders of the TSC:

- BASF – The Chemical Company
- Building Officials Association of Texas
- Cement Council of Texas
- Federal Alliance for Safe Homes (FLASH)
- Federal Emergency Management Agency (FEMA)
- FloodSmart
- Habitat for Humanity Texas
- International Code Council
- ISO
- KOHLER Generators
- National Storm Shelter Association
- National Weather Service
- Portland Cement Association
- RenaissanceRe
- Simpson Strong-Tie Co.
- State Farm Insurance Companies
- Texas Department of Insurance
- Texas Floodplain Management Association
- Texas Tech University, National Wind Institute
- The Home Depot
- The Salvation Army
- Truss Manufacturers of America
- USAA
- WeatherPredict Consulting Inc.

Top Three Hazards for South Central Texas: Hail, Flash Floods, and Thunderstorm Winds

Hail

Cold fronts often act as a focus for severe thunderstorms, bringing high winds, flooding and hail. On March 25, 2009, the north Austin area reported hail as large as 2 to 3 inches in diameter, the size of baseballs, causing significant damage to cars and homes. Total losses were estimated at over 150 million dollars.

Photo Courtesy of Troy Kimmel

Flash Floods

The Austin area has seen its fair share of flash flood events over the years. These events can occur in any season and are the direct result of Austin's topography and lack of deep soil. Being in the middle of "Flash Flood Alley," Austin recently added one more historic flash flood to her record, the Halloween Flash Flood on October 30-31, 2013.

Over 12 inches of rain fell just a few miles southwest of Austin in the early morning hours of October 31, 2013. This produced a flash flood along many nearby creeks and rivers, including Onion Creek on the south side of Austin.

Hundreds of homes were flooded along the Onion Creek Watershed in South Austin as the creek rose to record heights and the flow peaked at over 130,000 cubic feet per second. Numerous rescues of citizens were performed, many being plucked from roof tops as the fast rising water trapped many people in their neighborhoods. Several fatalities were reported as residents tried to escape the floodwaters in their automobiles.

Photo Courtesy of Gary Wilks

Thunderstorm Winds

Thunderstorms produce a wide range of hazards, including lightning, hail, and sometimes even tornadoes. However, the most frequent severe weather report comes from damaging winds. Also referred to as microbursts or straight line thunderstorm winds, these strong outflow winds in a storm can reach speeds of over 100 mph and can produce tornado like damage across a very large area.

Photo courtesy of NWS Austin-San Antonio, TX

While most damaging wind reports come from wind speeds near 60 mph, widespread damage across the city could include downed power lines, uprooted trees, broken tree branches, and even damage to billboard signs and fences. These strong winds can sometimes be part of a larger storm system that can bring damage across the entire Austin metropolitan area. Other times, an individual isolated severe thunderstorm may bring wind damage to a few streets of a single neighborhood.

Source: Unless otherwise noted, all information in this document courtesy of the National Weather Service. FLASH would like to thank the various individuals who contributed to this toolkit.

Building Codes Topline Messages

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Better Building Codes and Practices Save Lives, Property and Money

- **Building codes are a community's first line of defense against natural disasters, including flash floods, hurricanes, hail, tornadoes and wildfire.** Building codes offer a minimum level of life safety which is why modern, model codes and beyond-code building practices better protect homes and businesses against natural disasters.
    - Over the last 15 years, Texas has experienced its share of property damage from devastating natural disasters including:

By Year		By Cost	
2013	Tornadoes/Hail (Palo Pinto) - $200 million	$13 billion	Hurricane Ike
2012	Hail/Wind (McAllen) - $263 million	$4.7 billion	Tropical Storm Allison
2012	Tornadoes/Hail (Dallas/Ft. Worth) - $785 million	$3.4 billion	Hurricane Rita
2012	Hail Storm (Dallas/Ft. Worth) - $901 million	$1.1 billion	Hail Storm (North Texas)
2011	Wildfire (Bastrop County) - $367 million	$901 million	Hail Storm (Dallas/Ft. Worth)
2009	Hail Storm (Austin) - $150 million	$785 million	Tornadoes/Hail (Dallas/Ft. Worth)
2008	Hurricane Ike (Galveston) - $13 billion	$605 million	Tornado (Ft. Worth)
2008	Hurricane Dolly (Port Mansfield) - $543 million	$543 million	Hurricane Dolly (Port Mansfield)
2005	Hurricane Rita (Sabine Pass) - $3.4 billion	$367 million	Wildfire (Bastrop County)
2003	Hail Storm (North Texas) - $1.1 billion	$263 million	Hail/Wind (McAllen)
2001	Tropical Storm Allison (Houston) - $4.7 billion	$200 million	Tornadoes/Hail (Palo Pinto)
2000	Tornado (Ft. Worth) - $605 million	$150 million	Hail Storm (Austin)

- **Better building codes and mitigation save lives and limit property losses.**
    - A 2011 Louisiana State University Hurricane Center study determined that if strong building codes had been in place before Katrina, wind damage would have been reduced by 80 percent, and $8 billion in property losses would have been saved.
    - A December 2013 report by the Federal Insurance Office of U.S. Department of the Treasury stated "proper construction techniques and materials can save lives and reduce both insured losses and taxpayer burden." The report further cited that "effective mitigation strongly enhances the safety of occupants and durability of property."

- **Better building codes and mitigation reduce the burden on taxpayers and local governments tasked with providing first responders and emergency management services.**
    - A 2005 study by the National Institute of Building Sciences' Multihazard Mitigation Council documented that $1 spent on mitigation for activities ranging from enhanced building codes and public awareness to large scale physical retrofitting and other mitigation construction projects saves society an average of up to $4.

- **Better building codes prevent economic disruption to businesses, their employees and the overall community.**
    - According to the National Oceanic and Atmospheric Administration, there have been 25 major disasters in the last two years that have caused more than $1 billion in economic losses.

Mitigation Incentives

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Introduction to Texas Windstorm Insurance Association (TWIA)
TWIA provides windstorm and hail insurance coverage to coastal residents when private insurance companies exclude such coverage from their residential policies. TWIA currently provides this coverage in 14 Texas coastal counties as well as parts of Harris County. Generally, for designated catastrophe areas to be eligible for TWIA coverage, all construction, alteration, remodeling, enlargement, and repair of, or addition to, any structure in the designated catastrophe area must be performed in compliance with the applicable building code standards, as set forth in the plan of operation.

TWIA Credits for Meeting or Exceeding Applicable Building Code
TWIA offers premium discounts ranging from 19% to 33% for building code compliance depending on the location of the insured property and which building code the home is constructed to meet. The Texas Department of Insurance (TDI) must certify the structure as meeting the requirements specified in the TWIA Building Code or the I-Codes adopted by TDI since February 1, 2003 to qualify for the rate reductions. The rate reductions apply to windstorm and hail insurance policies issued by TWIA on and after February 28, 1999 for the TWIA Building Code and on and after July 31, 2003 for the I-Codes adopted by TDI since February 1, 2003.

TWIA Discounts for Existing Structures with Retrofitted Exterior Openings
TWIA policies are eligible for a rate reduction of 10% for dwelling coverage and 10% for personal property coverage for residential structures in a designated catastrophe area constructed prior to September 1, 1998, or February 1, 2003, as applicable, which have been retrofitted with exterior opening protection that meets the windborne debris impact-resisting standards established by TDI. “Exterior openings” are defined as “Openings in the exterior walls or roofs of residential structures, including, but not limited to, windows, doors, garage doors, and skylights.” All exterior openings of the residential structure must be protected.

Homeowners’ and TWIA Discounts for Impact-Resistant Roofing
Many insurance companies offer a discount for impact-resistant roof coverings to their policyholders. Each insurance company has the ability to determine the test standards the products must comply with and the types of discounts or credits they offer. Also, TWIA offers credits to residential structures for impact-resistant roof coverings tested to UL Standard 2218. The credits range from 4% to 14% based on the territory, date installed, and class of roof from UL 2218.

Homeowners’ Discount for Homes Constructed with an Insulating Concrete Form System
Texas Statutes authorize an insurer the option to grant an applicant a discount on the applicant’s homeowners’ insurance premiums for insured property on receipt of written verification from the applicant that the property was constructed with an insulating concrete form system. "Insulating concrete form system" is defined as “a building construction system primarily used to frame exterior walls in which polystyrene foam forms are placed in the walls of a structure under construction and filled with concrete and steel reinforcing material to become a permanent part of the structure.”

Freeboard, NFIP Premium Savings and CRS Credits
The *2008 Supplement to the 2006 Evaluation of the National Flood Insurance Program’s Building Standards* validated the 2006 publication’s general hypothesis of freeboard’s benefits to homeowners and communities—both regarding avoided flood damages and National Flood Insurance Program (NFIP)

premium savings offsetting the additional costs of construction. This report provides additional information regarding NFIP premiums and construction costs as they correlate to different amounts of freeboard, and is available at http://www.fema.gov/media-library/assets/documents/31735?id=7241. Furthermore, participating communities may receive NFIP Community Rating System (CRS) credits if the community requires freeboard, in accordance with CRS specifications. For more information about the CRS Program, visit http://www.fema.gov/national-flood-insurance-program-community-rating-system.

Sources: TDI, *Texas Windstorm Insurance Association Overview*, August 9, 2013 Edition.
Introduction to TWIA Building Code Standards: Tex. Insurance Code § 2210.258; Tex. Admin. Code, §5.4007 -11.
TWIA Credits for Meeting or Exceeding Building Code: 28 Tex. Admin. Code, §5.4700; Tex. Insurance Code §2210.351.
TWIA Discounts for Existing Structures with Retrofitted Exterior Openings: 28 Tex. Admin. Code § 5.4700.
TWIA Discount for Impact-Resistant Roofing: Tex. Insurance Code §2251.101 for rate filing authority.
Insulating Concrete Form System Homeowners' Discount: Tex. Insurance Code §§ 2006.001-2.
Freeboard, National Flood Insurance Program (NFIP) Premiums and Community Rating System (CRS) Credits: Federal Emergency Management Agency, *2008 Supplement to the 2006 Evaluation of the National Flood Insurance Program's Building Standards*; Federal Emergency Management Agency, *National Flood Insurance Program Community Rating System*.
FLASH would also like to thank the generous assistance of Dr. Paul Bove with TDI in the development of this content.

Executive Summary of Findings

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City of Austin/Travis County

The following is an executive summary of findings from an analysis conducted of the residential building code in effect for your community as it compares to model codes and beyond-code disaster resilient building practices.

Residential Building Code for City of Austin:
2012 International Residential Code with amendments

Residential Building Code for Travis County:
See Additional Background

Residential Building Code Opportunities:

- Recommend impact-resistant roof coverings with a rating of Class 3 or 4 when tested in accordance with UL 2218 or FM 4473, to provide increased resistance to hail and debris resulting from thunderstorm winds
- Increase wind design speed value to ASCE 7-05 wind speed value plus 20 mph, increase roof deck thickness and add requirement for sealed roof deck for additional protection against hurricane winds, wind-borne debris and hail
- For additional protection against wildfire, require that all roof coverings and individual replacement shingles or shakes be a minimum Class A

Building Code Effectiveness Grade Scale (BCEGS) Rating for City of Austin: 4

Building Code Effectiveness Grade Scale (BCEGS) Rating for Travis County: 99

All communities need building codes to protect their citizens from weather risks such as hurricanes, tornadoes, flash floods, hail, and wildfire. Safe, strong and sustainable homes that are more resilient against damage from natural disasters also support a more stable local economy, fewer taxpayer burdens, and reduced demand for emergency services.

Local elected leaders committed to protecting the public have a central role in improving the level of safety for homes built in their communities. Strong building codes and effective enforcement of those are the foundation for disaster-resilient communities.

Additional Background

City of Austin[1]

The City of Austin has a population of 790,390 [2010 Census], and it has adopted the 2012 IRC (with amendments).[2]

Regarding some building code processes in the City of Austin, the City Council may amend the residential building code, and the Planning and Development Review Department is responsible for design services.[3] In the City of Austin, a building official is described as the city manager's appointee to perform the city manager's duties.[4]

A Building and Fire Code Board of Appeals hears and decides appeals from actions made by the building official relating to the Building and Fire Code.[5]

Travis County

Travis County has a population of 1,024,266 [2010 Census].[6]

On September 1, 2009, the Travis County Commissioners Court adopted an order to apply to new residential construction within that portion of the County's unincorporated area that is not within a city's extra-territorial jurisdiction or otherwise subject to that city's building code—outlining a residential building code, inspections, and notices, available at http://www.co.travis.tx.us/TNR/permits/pdf_files/chapter_80.pdf.

However, some Texas counties perceive that they lack effective enforcement power over residential building codes. Adoption and enforcement are the key requirements for strong building codes, and it is important to understand that adoption without adequate enforcement places both people and property at risk.

Additionally, Travis County has its own floodplain regulations and permitting requirements.

[1] The material in this document and throughout this toolkit is for informational and educational use only, and it is in no way intended to constitute legal advice. Contact the local government or other authority for official building code information.
[2] Austin City Code, Title 25, Land Development; Chapter 25-1 General Requirements and Procedures.
[3] "About the Planning and Development Review Department." Available: http://austintexas.gov/department/planning/about
[4] Austin City Code, Title 1. Chapter 1-1. § 1-1-2 General Definitions.
[5] Austin City Code, Title 2. Administration. Article 2. Boards, § 2-1-121 Building and Fire Code Board of Appeals.
[6] This figure includes the population of the City of Austin. The total population of Travis County without the City of Austin according to the 2010 Census is 233,876.

Amendment Profile Layout
City of Austin: Substantial Amendment Changes to 2012 IRC, Impacts & Recommendations

	IRC Section	Current Amendment	Impact	Recommendation
1 - Strengthens	R103 Department of Building Safety	Deleted IRC Section R103 "Department of Building Safety" and replaced with R103.0 "Qualified Inspectors" and several subsections	Adds provisions requiring inspectors who perform inspections to possess the necessary qualifications established in additional subsections	Continue practice of specifying training requirements for building inspectors for residential construction
2 - Strengthens	R322.2.1 Elevation requirements 	Adds 12" freeboard above the design flood elevation	12" freeboard provides additional flood protection and results in potential insurance premium reductions; 2012 IRC generally does not require freeboard (outside of Coastal A and V Zones)	Continue practice of requiring freeboard, an effective measure of increasing a structure's resistance to flooding
2012 International Residential Code				
3 - 2012 IRC	N/A 	City of Austin does not specify requirements for impact-resistant roofing for residential structures	The 2012 IRC does not contain provisions regarding impact-resistant roofing; roof coverings are a major element often damaged by hail	Recommend impact-resistant roof coverings with a rating of Class 3 or 4 when tested in accordance with UL 2218 or FM 4473, to provide increased resistance to hail and debris resulting from thunderstorm winds
4 - 2012 IRC	Table R301.2(1) Climatic and Geographic Design Criteria 	City of Austin specifies 90 mph (3-sec gust) for wind design speed in table R301.2(1)	City of Austin's current wind design speed corresponds to values in 2012 IRC	For additional protection from high-wind events, increase the ASCE 7-05 wind speed value 20 mph, increase roof deck thickness, and add requirement for sealed roof deck
5 - 2012 IRC	R902.1 Roofing covering materials 	City of Austin has not amended Section R902.1	2012 IRC Section R902.1 provides that Class A, B or C roofing be installed when required by a jurisdiction or when the roof edge is under 3 feet from a lot line	For additional protection against wildfire, require that all roof coverings and individual replacement shingles or shakes be a minimum Class A
6 - 2012 IRC	R110.1 Certificate of Occupancy (C.O.)	City of Austin has not amended Section R110.1	2012 IRC Section R110.1 provides that the building official must issue a C.O. before occupancy or change in use	Continue requirement of C.O. to increase likelihood that the dwelling may be safety occupied and is constructed to code
2012 International Residential Code				

City of Austin: Substantial Amendment Changes to 2012 IRC, Impacts & Recommendations – Technical Notes

1) Amendment 1 Impact

IRC Section R103 “Department of Building Safety” was deleted and replaced with several provisions under the section R103.0 “Qualified Inspectors”, which requires inspectors who perform inspections to possess the necessary qualifications established in additional subsections for Residential Combination Inspector Supervisors, Residential Combination Inspectors, and people hired by the City as a Residential Combination Inspector—including maintaining specified licensure and certifications. Building code inspectors serve a crucial role in reviewing the planning and construction of structures at different phases of construction. Adding requirements for building inspector education is likely to result in homes constructed with better workmanship and in line with the jurisdiction’s building code.

2) Amendment 2 Impact

The City of Austin adds a requirement of a minimum 12” freeboard to IRC Section 322.2.1 “Elevation requirements”. It also specifies an elevation of a minimum of 12” above the design flood elevation in R322.1.6 “Protection of mechanical and electrical systems”. There are many differences between the City of Austin’s floodplain regulations and those in Section R322 “Flood-Resistant Construction” of the 2012 IRC, and our recommendation focuses on increasing freeboard as just one measure of increased flood protection. Individual homes face different flood risks, and homeowners should learn their dwelling’s risk from local floodplain management professionals and other resources like those provided by the National Flood Insurance Program (NFIP). A general recommendation for improving a dwelling’s flood resistance is to incorporate freeboard above the BFE. This added factor of safety may also result in reduced flood insurance premiums. Furthermore, if your community participates in the NFIP Community Rating System (CRS) program, there could be additional flood insurance premium discounts up to 45 percent.

3) Provision 3 Impact

The most effective way to minimize hail damage to a structure’s roof system is to use roofing materials that are resistant to hail impacts. Hail damage occurs on other elements of the structure as well (e.g., windows and sidings), which should be considered for potential mitigation measures. While the IRC does not require impact-resistant roof coverings, such coverings are an effective way to increase resistance to hail and debris damage resulting from thunderstorm winds.

4) Provision 4 Impact

The basic wind speed value in Table R301.2(1) conforms with the values specified in the basic wind speed map on Figure R301.2(4)A in the 2012 IRC. Since thunderstorm winds are one of the top three weather hazards identified by the Weather Forecast Office for the City of Austin, additional design measures can be taken to protect structures from high-wind events. We recommend increasing the ASCE 7-05 wind speed value 20 mph (this value should be revisited if ASCE 7-10 applies), increasing roof deck thickness, and adding a requirement for sealed roof deck.

5) Provision 5 Impact

Section R902.1 “Roofing covering materials” sets forth criteria when Class A, B or C roofing are required. Class A, B and C roofing have been tested for fire exposure protection. However, Class A is the highest rated roof class for fire exposure protection in accordance with ASTM E108 or UL 790. Upgrading to Class A roof coverings will provide increased resistance to the spread of wildfire.

6) Provision 6 Impact

Generally, a C.O. is granted upon a determination that a structure may be occupied for its intended use. Before a C.O. is issued, compliance with the applicable building code is typically reviewed. Use of a C.O. is an important enforcement tool for a jurisdiction’s building official, which may lead to increased compliance with building codes.

Average Texas Home Profile

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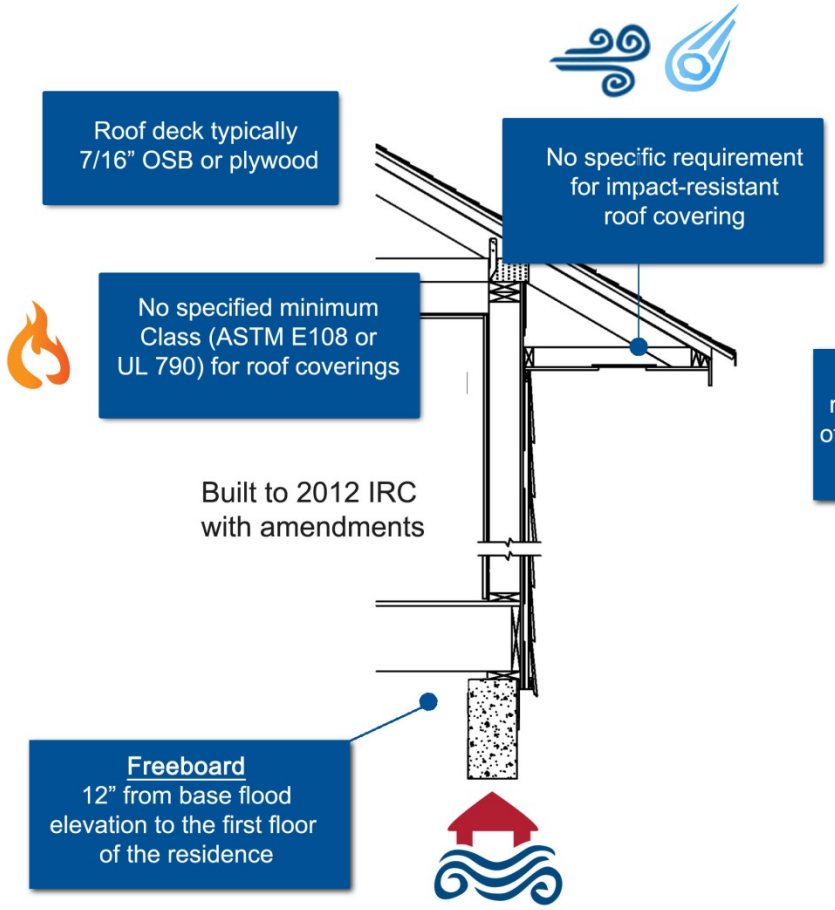
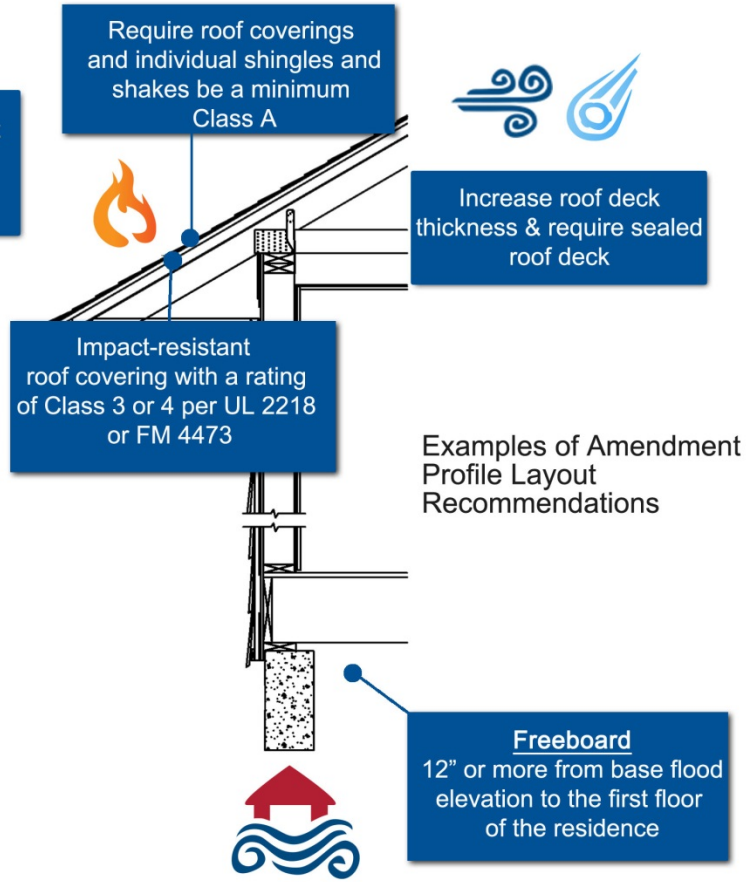
Approximately 2850 square feet
Median price $197,000

Current Residential Practices for Homes Built in City of Austin



Recommended New or Retrofit Construction for Weather-Ready Homes



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How does City of Austin/Travis County Rate on Building Code Enforcement?

(The lower the class number is, the more favorable the rating)

City of Austin's BCEGS rating is: 4

Travis County's BCEGS® rating is: 99

Building Code Effectiveness Grading Scale (BCEGS) classification, a program of the Insurance Services Office, Inc. (ISO)®, is a tool used to measure the effectiveness of a jurisdiction's building code enforcement. The BCEGS program assesses the adoption and enforcement of a community's building codes with special emphasis on mitigation of losses from natural hazards. ISO collects information regarding the administration of building codes, building plan review, field inspections, and other underwriting data. This information is used to determine a "class" based on a 1 to 10 scale. The lower the class number is, the more favorable the rating. A BCEGS Class 99 rating may be assigned for several reasons: the properties were developed prior to the initial BCEGS evaluation, the jurisdiction does not meet the participation requirements of the BCEGS program, or the jurisdiction declines participation in the BCEGS program. More information can be found at http://www.isomitigation.com/bcegs/building-code-classification.pdf.

One important issue for Texans is that while certain Texas counties, including Travis County, may adopt a residential building code, at least some Texas counties believe that they lack meaningful enforcement power over those building codes. Without effective enforcement, Texans in Travis County lose the assurance that their homes are, in fact, constructed to that minimum standard.

Why building code enforcement is essential

Many Texas communities are at risk of severe damage from hurricanes, floods, tornados, wildfires and other disasters. Adoption and effective enforcement of residential building codes creates the first line of defense for Texans against severe weather events. Texans deserve strong, safe and resilient homes for protection of their families and financial security.

State and local jurisdictions have the opportunity—and in some cases, the obligation—to adopt updated building codes and enforce them. However, the adoption of modern, model building codes is only half of the equation. A jurisdiction's adoption of a building code can be rendered meaningless without effective enforcement. Furthermore, professional and ongoing training and certification of building officials is essential to effective enforcement.

Communities benefit from a favorable BCEGS classification. For example, a favorable BCEGS classification may positively impact jurisdictions in one or more of the following ways:

- Result in better homeowners and commercial insurance rates
- Allow the community to apply for a better class rating in the Community Rating System (CRS), which may in turn result in lower insurance premiums
- Reflect and further incentivize better building practices that strengthen a community's resilience against disasters

For more information about the BCEGS program, call ISO at (800) 444-4554 or e-mail bcegsupdate@verisk.com.

Frequently Asked Questions

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What are building codes?
Building codes have been in use in the United States for more than 100 years, when major cities began to adopt and enforce building codes in response to large fires in densely populated urban areas. While early building codes were in place to reduce fire risk, today's building codes are the minimum acceptable standards to protect the health, safety and general welfare of building occupants.

Building codes can be classified as either "prescriptive" or "performance" based. Performance codes provide a technical objective which leaves the method of achieving the objective up to the architect/engineer and builder. Prescriptive codes specify the method for designers and builders to achieve the objective. Some model codes, like the International Residential Code (IRC) have both prescriptive and performance based provisions, although the IRC is a prescriptive-oriented code.

What is the process and timeframe for developing model building codes?
The IRC for One- and Two-Family Dwellings is developed by the International Code Council (ICC) through the governmental consensus process. The IRC is revised every 18 months and new editions are published every three years. Most United States jurisdictions that adopt a residential code adopt an edition of the IRC, sometimes with amendments.

Model building codes developed by the ICC, like the IRC, establish minimum regulations for construction. They are a starting point—not a guarantee that a structure is impervious from natural disaster. The analysis contained within the Texas Leadership Toolkit is based on the notion that modern, model building codes reflect the best available minimum building materials and practices; nonetheless, certain building materials and practices beyond these minimum standards should be considered for optimal resiliency.

Why are building codes important?
Modern, model building codes that are consistently enforced by well-trained professionals are important steps to becoming a disaster-resilient community. Building codes protect the public health and safety. The increased burden from weak building codes or lax enforcement falls on taxpayers – through property losses, higher insurance premiums and lost economic opportunities. According to the Federal Emergency Management Agency (FEMA), structures built to higher standards are 77 percent less likely to be damaged.

Do stronger building codes make a difference when severe weather strikes?
Modern, model building codes reflect the best available building practices to build to minimum regulations. Homes built to modern, model building codes will have the advantage of better wall bracing, improved roof tie-downs and overall stronger connections. For example, wind-resistant building practices like those included in the 2012 IRC can dramatically improve building performance during hurricanes and tropical storms. Moreover, according to the National Institute of Building Sciences, for every $1 spent to make buildings stronger, the American taxpayer saves $4 in federal disaster assistance.

What is a Certificate of Occupancy and why is it important?
Generally, a certificate of occupancy (C.O.) is a document provided by a city or county upon determination that a structure may be safely occupied for its intended use. It is often required after new construction and changes in occupancy classifications, as well as for other conditions as specified by a jurisdiction. Before a C.O. is issued, compliance with the applicable building code is typically reviewed. Use of a C.O. is an important enforcement tool for a local building official.

Who is responsible for enforcing building codes?
It is the responsibility of state and local jurisdictions to adopt and enforce building codes. Many communities are at risk of severe damage from hurricanes, floods, tornados, wildfires and other disasters. Adoption and effective enforcement of building codes creates a crucial line of defense against severe weather events.

Does it cost more to build to modern, model building codes?
The most cost-effective and efficient means of strengthening buildings is at the time of new construction. Modern, model building codes ensure that new construction takes advantage of continuous innovation in building design, products, methods and technologies. Often, there is only a marginal increase in costs to build better.

Communities with model codes that are well-enforced experience less damage and lower insured losses from severe weather events and rank better on the Building Code Effectiveness Grading Scale (BCEGS). Communities that adopt model codes also compete more effectively for large employers who bring jobs, economic vitality and an overall stronger business climate.

What is the link between discounts on homeowners' insurance premiums and building codes?
The Texas Windstorm Insurance Association (TWIA) provides windstorm and hail insurance coverage to coastal residents when private insurance companies exclude such coverage from their residential policies. TWIA currently provides this coverage in 14 Texas coastal counties as well as parts of Harris County.

TWIA offers premium discounts ranging from 19% to 33% for meeting or exceeding applicable building codes depending on the location of the insured property and which building code the risk is constructed to meet, including discounts for existing or new homes that:

- have retrofitted all exterior openings such as windows, doors, garage doors and skylights;
- have impact-resistant roof covering; and
- are constructed with an insulating concrete form system.

To learn more, check out the one-page summary included in this toolkit.

Sources: Federal Emergency Management Agency, *Building Codes Toolkit, Frequently Asked Questions,* http://www.fema.gov/media-library-data/20130726-1902-25045-9664/building_codes_toolkit_faq_508.pdf; *2012 International Residential Code for One- and Two- Family Dwellings*® (International Code Council, Inc., 2011) , vii.

Resources

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Texas

- Texas Department of Public Safety, Division of Emergency Management, http://www.txdps.state.tx.us/dem/index.htm
- City of Austin – Office of Homeland Security and Emergency Management, https://austintexas.gov/department/homeland-security-and-emergency-management
- Austin-Travis County Community Wildfire Protection Plan, http://flash.org/pdf/140630Austin-TravisCoCWPP_REV140722.pdf
- Travis County – Office of Emergency Management, http://www.co.travis.tx.us/emergency_services/emergency_management.asp
- Building Officials Association of Texas, http://www.boatx.org/
- National Fire Protection Association – Firewise Communities, www.firewise.org (Texas - www.firewise.org/wildfire-preparedness/be-firewise/success-stories/texas.aspx)
- Texas Association of Regional Councils, http://www.txregionalcouncil.org/
- Texas Department of Insurance, http://www.tdi.texas.gov/
- Texas Floodplain Management Association, http://www.tfma.org/
- Texas Fire Marshal's Association, http://www.txfma.org/

Other

- National Weather Service, http://www.weather.gov/
- National Hurricane Center, http://www.nhc.noaa.gov/
- Insurance Services Office (ISO), http://www.iso.com/
- Federal Alliance for Safe Homes (FLASH), http://www.flash.org/
- Federal Emergency Management Agency (FEMA)
    - FEMA Building Codes & Technical Publications: http://www.fema.gov/building-science-publications
    - FEMA Building Sciences Branch: http://www.fema.gov/protecting-homes
    - FEMA Helpline: BuildingScienceHelp@fema.dhs.gov
- International Code Council (ICC)
    - International Building Code: http://shop.iccsafe.org/2012-international-building-code-1.html
    - International Residential Code: http://shop.iccsafe.org/codes/2012-international-codes/2012-international-residential-code/2012-international-residential-code-for-one-and-two-family-dwellings.html
    - International Existing Residential Building Code: http://shop.iccsafe.org/2012-international-existing-building-code-1.html