Texas State Collaborative

Established 2012

City of El Paso/El Paso County

Leadership Toolkit

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Established 2012

TOOLKIT LEGEND

Introduction

Texas State Collaborative
Established 2012

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 El Paso/El Paso County and to help spotlight what residential building code is in effect and what that means with respect to life safety for City of El Paso/El Paso 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
- 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

Top Three Hazards for the City of El Paso: Flash Floods, Downburst Winds, and Hail

Flash Floods

August 1, 2006 Historic Flash Flood

On August, 1, 2006, part of the larger monsoon of 2006, a damaging flash flood event affected El Paso and its vicinity. Three to almost 10 inches of rain fell over mainly the western and northeastern portions of El Paso between 4 a.m. and 2 p.m. Northwest El Paso had the heaviest amounts of 6 to nearly 10 inches with 4 to 7 inches of rain falling across the north and northeastern sections of the city. Prolonged and occasionally heavy rainfalls forced arroyos and streams to rapidly overflow, causing streets to become raging torrents of water. The floodwaters severely damaged or destroyed homes, businesses and other property and overturned or carried away motor vehicles. Many roads were closed, including Interstate 10.

In the city of El Paso, water rescues were required in some neighborhoods. Just north of El Paso, the entire village of Vinton, Texas was evacuated as arroyos overflowed, streets flooded, and water rose to a depth of almost 5 feet in some neighborhoods. Extensive flooding also damaged or destroyed much of Canutillo where high waters inundated homes and closed roads. Later in the summer, public safety officials declared portions of Canutillo permanently uninhabitable as a result of the floods.

Photos courtesy of WFO El Paso, TX

Downburst Winds

West El Paso July 24, 2013 Downburst

On July 24th, 2013, a strong downburst occurred in the Upper Valley section of El Paso, Texas. Winds associated with this storm were estimated at over 70 mph. Several lifetime El Paso residents said they had never experienced such a storm. According to local media reports, more than 50 trees were knocked over in the Upper Valley, some over 50 feet tall. Several power lines were also blown down or had trees fall on them. One tree crushed the midsection of a parked car. A new construction building with the framing and walls recently completed was completely destroyed. These winds extended at least 7 to 10 miles north of the location where the initial detection of the downburst occurred.

Photos courtesy of WFO El Paso, TX

Hail

September 16, 2009 Damaging Hail Event

On September 16, 2009, a large supercell thunderstorm developed over El Paso producing golf-ball to tennis-ball sized hail. It moved across the heart of El Paso's east side and then southeast along Interstate 10. Damage from the storm was over $150 million.

During the morning of September 16th, a cold front pushed into the area bringing with it slightly cooler temperatures and moist air. But, more importantly, it ushered in some strong easterly winds. In the

middle and upper part of the atmosphere, an upper level low was dropping south along the Arizona/New Mexico border. Ahead of this system were strong westerly winds. Among the ingredients needed to help develop supercell thunderstorms are winds that turn (or change direction) in the atmosphere. This was a case of strong southeasterly winds at the surface with strong westerly winds aloft, which is a perfect environment for supercell thunderstorms development.

A little before 4 p.m. the second of two supercell thunderstorms developed almost directly over the El Paso International Airport. It quickly became severe and began to move to the southeast. The storm strengthened and began dropping golf-ball-sized hail over a large swath of El Paso's east side, with some hailstones reaching tennis-ball size. The storm continued to move to the southeast, over and alongside Interstate 10, affecting numerous residential areas and business districts. Within this path were several auto dealerships. The storm finally weakened as it moved across southern El Paso County and into western Hudspeth County, but not before shattering windows, destroying roofs and skylights, and denting hundreds of automobiles.

Photos courtesy of WFO El Paso, TX, from the El Paso Times. http://www.srh.noaa.gov/epz/?n=elpaso_hail_storm_2009

Source: Unless otherwise noted, all information in this document is 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 El Paso/El Paso 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 El Paso:
2009 International Residential Code with amendments

Residential Building Code for El Paso 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 downburst winds
- Incorporate freeboard 12” or greater above Base Flood Elevation for additional flood protection
- 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 wind-borne debris and hail

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

Building Code Effectiveness Grade Scale (BCEGS) Rating for El Paso 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 El Paso[1]

The City of El Paso has a population of 649,121 [2010 Census], and effective January 1, 2011, it adopted the 2009 IRC (with amendments).[2]

Regarding some building code processes in the City of El Paso, the building official (building permits and inspections division or the code compliance division of departments of the city or as designated by the city manager) is tasked with enforcement of the codes, including providing interpretations of the codes.[3]

Additionally, a Construction Board of Appeals has various roles including: (1) hearing appeals from building code determinations; (2) making recommendations to the building official regarding code changes; (3) making recommendations to the building official regarding the appropriateness of materials, methods, or equipment for use in the city; and (4) making recommendations of standards for residential construction in the city.[4]

El Paso County

El Paso County has a population of 800,647 [2010 Census][5]. On September 17, 2012 the Commissioners Court of El Paso County, Texas 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 extraterritorial jurisdiction or otherwise subject to that city's building code—outlining a residential building code, inspections, and notices, available at http://www.epcounty.com/publicworks/Documents/NewResidentialInspectionProgram/AdoptedResidential%20BuildingInspectionCodeOrder.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, El Paso 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] El Paso City Code. Title 18 – Building and Construction. 18.10.020 "Adoption".
[3] El Paso City Code. Title 18 – Building and Construction. 18.02.103.2 "Administration and enforcement".
[4] El Paso City Code. Title 2 – Administration and Personnel. 2.30.060 "Powers".
[5] This figure reflects the total population with the City of El Paso included within it. The total population of El Paso County according to the 2010 Census without the City of El Paso included is 151,526.

Amendment Profile Layout
City of El Paso: Substantial Amendment Changes to 2009 IRC, Impacts & Recommendations

	IRC Section	Current Amendment	Impact	Recommendation
1- Strengthens	R802.10.2 Design	Adding requirement that truss design drawings are prepared, signed, and sealed by a registered professional engineer, licensed in Texas	The IRC provides that wood trusses be designed in accordance with engineering practice; therefore, these added requirements for truss drawings furthers the likelihood that such drawings properly accommodate and transmit loads specific to that dwelling	Continue practice of beyond-code building practices
2009 International Residential Code				
2 - 2009 IRC	Table R301.2(1) Climatic and Geographic Design Criteria 	City of El Paso specifies 90 mph (3-sec gust) for wind design speed in table R301.2(1)	City of El Paso's current wind design speed corresponds to values in 2009 IRC, although El Paso is close to a special wind region	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
3 - 2009 IRC	N/A 	City of El Paso does not specify requirements for impact-resistant roofing for residential structures	The 2009 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 downburst winds
4 - 2009 IRC	R322 Flood-Resistant Construction 	City of El Paso floodplain regulations do not specify any freeboard above the Base Flood Elevation (BFE)	Freeboard provides additional flood protection and results in potential insurance premium reductions; 2009 IRC generally does not require freeboard (outside of Coastal A and V Zones)	Increase freeboard to 12" or greater above the BFE
5 - 2009 IRC	R110 Certificate of Occupancy (C.O.)	City of El Paso has not amended Section R110.1	2009 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

6 - 2009 IRC	R101.2 Scope	City of El Paso amended the IRC scope in several respects, including by expanding the scope to include attached two, three, or four-family dwellings having separate independent entries and open space on at least one side	Amending the scope of the IRC results in dwellings that were anticipated to be designed under the International Building Code (IBC) performance criteria are now to be designed under the IRC prescriptive criteria	Reinstate original IRC scope

City of El Paso: Substantial Amendment Changes, Impacts & Recommendations – Technical Notes

1) Amendment 1 Impact

Amendment 1 reflects the added requirement that truss design drawings are prepared, signed, and sealed by a registered professional engineer, licensed in Texas. The IRC provides that wood trusses be designed in accordance with engineering practice; therefore, requiring truss drawings to be prepared, signed, and sealed by a registered, licensed, professional engineer advances the likelihood that such drawings properly accommodate and transmit loads specific to that dwelling.

2) Provision 2 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) in the 2009 IRC, although El Paso is close to a special wind region. Since downburst winds are one of the top three weather hazards identified by the Weather Forecast Office for the City of El Paso, additional design measures can be taken to protect structures from downburst winds and other high-wind events. Additionally, 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.

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 downburst winds.

4) Provision 4 Impact

City of El Paso floodplain regulations do not specify any freeboard above the BFE for special flood hazard areas. There are many differences between floodplain regulations and the IRC, and our recommendation focuses on increasing freeboard as just one measure of increased flood protection. Individual homes face different flood risks, and homeowners can learn more about their dwelling's risk from local floodplain management professionals or from 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.

5) Provision 5 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.

6) Amendment 6 Impact

City of El Paso amended the scope of the IRC to include attached two, three, or four-family dwellings having separate independent entries and open space on at least one side. Accordingly, structures intended by the IRC to be subject to the IBC provisions (a performance-oriented code) now are under the IRC (a prescriptive-oriented building code). One potential problem with this approach is that in several respects the application of the IBC's provisions results in stricter requirements, for example regarding floor live loads, wall bracings, and roof tie downs.

Average Texas Home Profile

Texas State Collaborative
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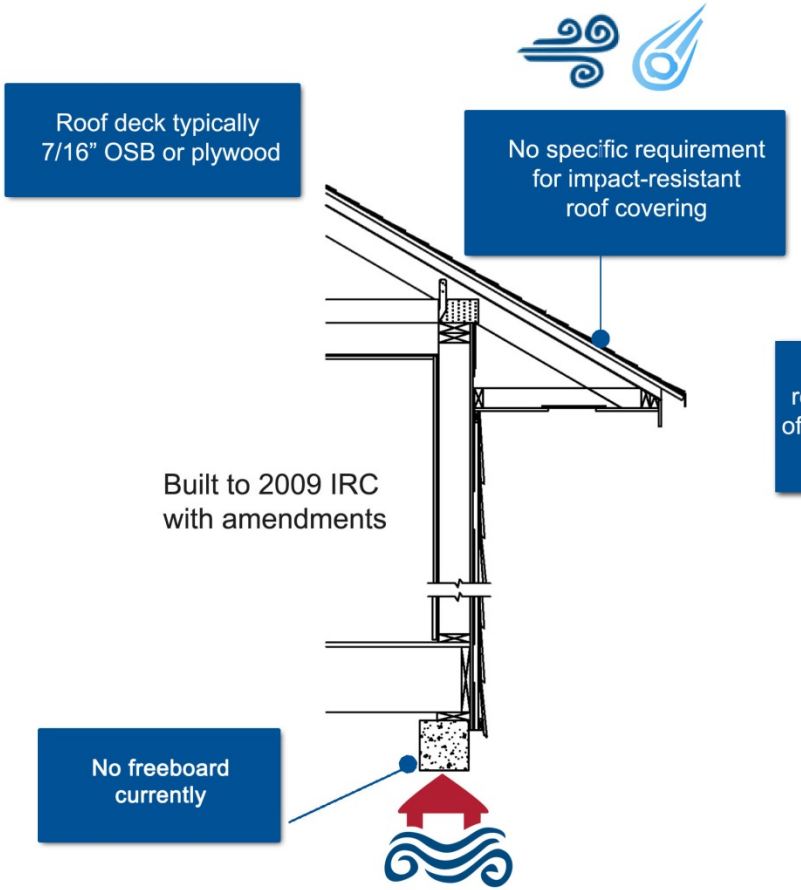
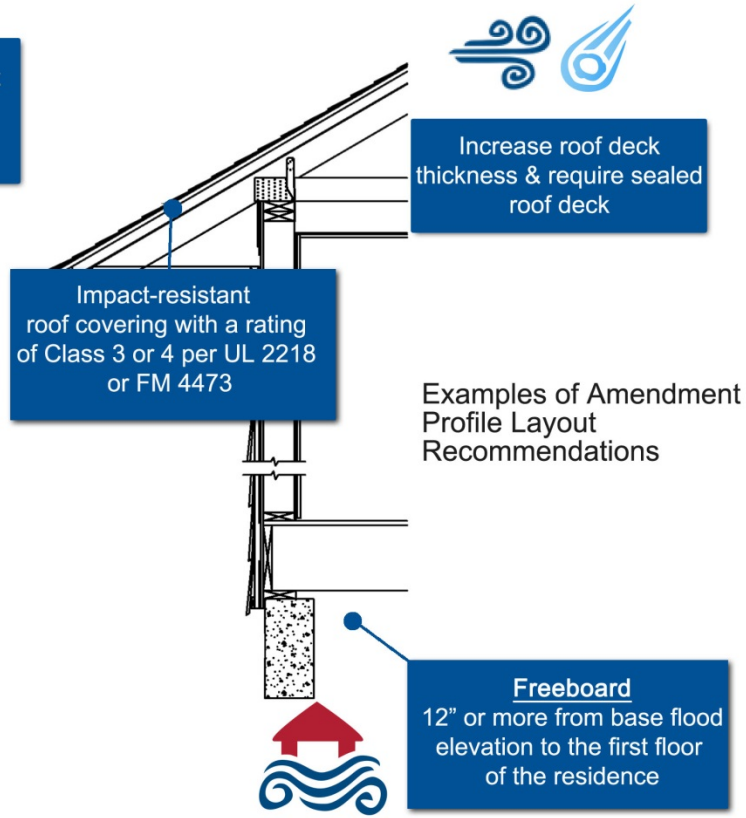
Approximately 2850 square feet
Median price $197,000

Current Residential Practices for Homes Built in City of El Paso



Recommended New or Retrofit Construction for Weather-Ready Homes



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How does City of El Paso/El Paso County Rate on Building Code Enforcement?

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

The City of El Paso's BCEGS® rating is: 4

El Paso 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 El Paso 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 El Paso 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

Texas State Collaborative
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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 (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
- El Paso City-County Office of Emergency Management – Office of Emergency Management, http://home.elpasotexas.gov/fire-department/emergency-about.php
- 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