Texas State Collaborative
Established 2012

City of McAllen/Hidalgo County
Leadership Toolkit
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TOOLKIT LEGEND

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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 (Toolkit) for the TSC to raise awareness of weather perils specific to City of McAllen/Hidalgo County and to help spotlight what residential building code is in effect and what that means with respect to life safety for City of McAllen/Hidalgo 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
- Office of the Public Insurance Counsel
- 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 Rio Grande Valley: Hurricane, Flood, and Hail

The primary weather hazard for widespread economic impact, property damage, and life disruption in the Rio Grande Valley is a tropical cyclone (hurricane, tropical storm or tropical depression). The combination of torrential rain, dangerous wind, and coastal inundation from storm surge can shut down communities for weeks to months, and recovery can take years. Inland floods not associated with tropical cyclones occur much more frequently in the Rio Grande Valley, but typically occur at city, town, or neighborhood scale. Wind and hail storms are a virtual tie for the third most common hazard for structural damage in the region.

Hurricane

September 20-22, 1967: Hurricane Beulah

Hurricane Beulah made landfall just south of Brownsville in September of 1967, then moved northwest through Willacy, Brooks, and Duval Counties before meandering southwest through Zapata County. Beulah brought damaging winds greater than 130 mph and a storm tide of 8 to 14 feet across South Padre Island and communities along the Laguna Madre. Hurricane-force winds lasted eight hours in Brownsville, with a peak wind of 109 mph before the anemometer fell at the airport observing station. 100 mph gusts were felt as far inland as Pharr, Weslaco, and Edinburg (Hidalgo County).

Beulah continued to wreak havoc while moving inland. The storm spawned at least 115 tornadoes in south Texas, but only one in the Rio Grande Valley. Beulah’s slow movement resulted in more than 20 inches of rain from Starr to Brooks County. Flooding devastated Falfurrias after more than 22 inches of rain pushed area creeks over their banks. Nearly every community in the Rio Grande Valley and rural deep south Texas had some type of flooding. High standing water flooded McAllen, Edinburg, and Raymondville. At least 15 people perished in Texas, none in the Rio Grande Valley.

Statewide damages (1967 dollars) were estimated at $170 million, with at least $100 million in the Rio Grande Valley/deep south Texas region. This would equate to more than $5 billion today, accounting for inflation and population increase.

Flooding in Harlingen after Hurricane Beulah’s rains overwhelmed the Arroyo Colorado. Photo credit: Brownsville Herald.
**Flood**

**Roma (Starr County) Floods, August 18-25, 2008**

A stationary complex of thunderstorms dumped an estimated 8 to 10 inches, near and just east of Roma, between daybreak and noon August 18, and caused widespread flash flooding in Roma and nearby communities of Garceño and Escobares when several arroyos, including Arroyo Quiote, became raging rivers.

Another vigorous atmospheric disturbance dropped into northern Mexico, south of the southwest Texas desert region and Big Bend region, between August 21st and 22nd. This disturbance helped to regenerate deep tropical moisture across the upper Rio Grande Valley and lift the moisture into smaller, but intense, thunderstorms across the west side of Roma, extending northward toward Falcon Dam. These rains were intense (7 inches or more) and caused widespread street flooding in the western and northwestern portions of Roma along the northward bend in Highway 83.

Atmospheric energy rotating around the upper level disturbance set up one final round of torrential rains across the upper Rio Grande Valley early on August 24th. Rainfall estimated to be at least 4 to 6 inches—perhaps more—flowed south out of the El Sauz/San Carlos area of northwest Starr County and reached previously swollen Arroyo Los Morenos, which soon overtopped its banks once again, possibly flooding up to six homes in Escobares.

Another 4 inches or more fell near areas impacted by the August 22nd floods, with roads closed in up to nine Roma neighborhoods; water was pushed into homes by passing vehicles. At least eight residents were rescued from the Las Flores subdivision, and a number of residents in the Robinson subdivision self-evacuated as water continued to rise or remain high. One resident was evacuated from a residence on Ranchito Street.

Damage assessment teams from the Red Cross had found nearly 1000 (981) homes to be impacted by the floods, with 30 sustaining major damage. Starr County Emergency Management officials estimated structural inundation ranged from a few inches to as high as five feet. A number of these homes were in newer communities near Arroyo Roma and Arroyo Quiote. At least 234 persons were evacuated by first responders. Structural damage and repair costs were estimated to be in excess of $1 million (2008 dollars).
Hail

March 29, 2012: McAllen Hailstorm
An intense "supercell" thunderstorm raked the highly populated McAllen/Edinburg/Mission area of Hidalgo County during the evening of March 29th, 2012. The storm dumped hail up the size of baseballs for more than half an hour, which was driven by 70 to 75 mph winds. Four to six inches of torrential rain flooded much of McAllen. Initial storms on the 29th were fueled by an upper level disturbance that acted on warm, humid air near the surface. The McAllen supercell was the grand finale.

In densely populated north McAllen, up to an hour of continuous hail, driven by frequent winds estimated at 70 to 75 mph, knocked at least one window out of every north-facing exposure, defoliated nearly every tree, left up to a half foot of accumulated hail on the ground, and produced hail drifts up to four feet high. Numerous tree limbs were blown down, many homes had roof damage, and broken glass and water littered the north facing rooms and apartments. Hundreds of vehicles left outdoors were severely damaged by golf ball to baseball size hail dents, including many shattered windows.

A hurricane force wind gust of 74 mph was observed at the McAllen/Miller Airport, a few miles south of the most devastating hail. Surrounding the hardest hit areas, locations in central McAllen to the edge of Edinburg received less hail and wind, but still enough to strip many leaves from trees, knock down fences, dent vehicles, and damage windows and roofs. Torrential rain accompanied the hail; between 4 and 6 inches fell in less than two hours.

For McAllen, the storm was epic. More than 200 persons were rescued from hail and wind damaged homes and flood waters, more than 1,000 homes and businesses were damaged, and more than 25,000 customers were without power during the peak of the storm. According to the Insurance Council of Texas and verified by the Property Claims Service of the Insurance Services Office, insured damages tallied $263 million (2013 dollars). Total damage including uninsured property, was likely tens of millions of dollars more. At the end of 2012, 2,800 homeowners' claims and 3,000 auto claims had been filed. The storm ranked 21st costliest in Texas since 1950, based on 2013 values.

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.
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:

<table>
<thead>
<tr>
<th>By Year</th>
<th>Event Description</th>
<th>By Cost</th>
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<tbody>
<tr>
<td>2013</td>
<td>Tornadoes/Hail (Palo Pinto)</td>
<td>$200 million</td>
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<tr>
<td></td>
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<td>$13 billion Hurricane Ike</td>
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<td>2012</td>
<td>Hail/Wind (McAllen)</td>
<td>$263 million</td>
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<td></td>
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<td>$4.7 billion Tropical Storm Allison</td>
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<tr>
<td>2012</td>
<td>Tornadoes/Hail (Dallas/Ft. Worth)</td>
<td>$785 million</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$3.4 billion Hurricane Rita</td>
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<tr>
<td>2012</td>
<td>Hail Storm (Dallas/Ft. Worth)</td>
<td>$901 million</td>
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<tr>
<td></td>
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<td>$1.1 billion Hail Storm (North Texas)</td>
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<tr>
<td>2011</td>
<td>Wildfire (Bastrop County)</td>
<td>$367 million</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$901 million Hail Storm (Dallas/Ft. Worth)</td>
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<tr>
<td>2009</td>
<td>Hail Storm (Austin)</td>
<td>$150 million</td>
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<tr>
<td></td>
<td></td>
<td>$785 million Tornadoes/Hail (Dallas/Ft. Worth)</td>
</tr>
<tr>
<td>2008</td>
<td>Hurricane Ike (Galveston)</td>
<td>$13 billion</td>
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<tr>
<td></td>
<td></td>
<td>$605 million Tornado (Ft. Worth)</td>
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<tr>
<td>2008</td>
<td>Hurricane Dolly (Port Mansfield)</td>
<td>$543 million</td>
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<tr>
<td></td>
<td></td>
<td>$543 million Hurricane Dolly (Port Mansfield)</td>
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<tr>
<td>2005</td>
<td>Hurricane Rita (Sabine Pass)</td>
<td>$3.4 billion</td>
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<td>$367 million Wildfire (Bastrop County)</td>
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<td>$150 million Hail Storm (Austin)</td>
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- 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.
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.
Freeboard, National Flood Insurance Program (NFIP) Premiums and Community Rating System (CRS) Credits:
FLASH would also like to thank the generous assistance of Dr. Paul Bove with TDI in the development of this content.
Benefits of Using the I-Codes in a Community’s Floodplain Management Program

Strong floodplain management regulations are integral to protect a community from the potentially devastating effects of flooding, which can occur without warning. Integrating the International Code Council’s I-Codes as part of a community’s floodplain management strategy furthers one of the long-term objectives of the National Flood Insurance Program: to reduce flood damage and losses. Communities that enforce the 2009 and later editions of the I-Codes can rely on the flood provisions of those codes for buildings and structures in flood hazard areas. Floodplain management regulations must also address other aspects of development in flood hazard areas.

There are various advantages to using the I-Codes as part of a community’s floodplain management program, including:

- Reduced conflicts between building codes and floodplain management regulations
- Building construction requirements regarding perils are consolidated and are easy to reference
- Increased assurance of quality building
- Building codes have some increased standards and more specific requirements than the NFIP requirements
- Increased consistency in permit conditions and requirements
- Regulation of all buildings and structures, in flood hazard areas resulting in consolidated and strengthened enforcement; effective, routine inspections; and increased compliance of regulations in existing buildings

For more information about how a community can use the I-Codes as a part of its floodplain management strategy, see Reducing Flood Loss Through the International Codes: Coordinating Building Codes and Floodplain Management Regulations, Fourth Edition, 2014.

Additionally, the 2008 Quick Guide: Floodplain Management in Texas is an excellent resource to better understand floodplain management and development.

Sources:


Executive Summary of Findings

City of McAllen/Hidalgo 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 McAllen:**

2012 International Residential Code

**Residential Building Code for Hidalgo County:**

None

**Residential Building Code Opportunities:**

- Require freeboard of 12” or greater above the BFE, an effective measure of increasing a structure’s resistance to flooding
- 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

**Building Code Effectiveness Grade Scale (BCEGS) Rating for City of McAllen:** 3

**Building Code Effectiveness Grade Scale (BCEGS) Rating for Harris 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 McAllen

The City of McAllen has a population of 129,877 [2010 Census], and it currently has the 2012 IRC (with few amendments).

Regarding some building code processes in the City of McAllen, the residential code may be amended by the Board of Commissioners², and the Building Official enforces the provisions of the Code.³

Hidalgo County

Hidalgo County has a population of 774,769 [2010 Census].⁴ Hidalgo County has not adopted a mandatory residential building code.

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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 Charter, City of McAllen, Texas, Article 3, Section 16.
³ Code of Ordinances, City of McAllen, Texas, Section 22-4.
⁴ This figure reflects the total population with the City of McAllen included within it. The total population of Hidalgo County according to the 2010 Census without the City of McAllen included is 644,892.
<table>
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<th>Impact</th>
<th>Recommendation</th>
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<td>1 – 2012 IRC</td>
<td>R322 Flood-Resistant Construction</td>
<td>City of McAllen’s floodplain regulations do not specify any freeboard above the Base Flood Elevation (BFE)</td>
<td>Require freeboard of 12” or greater above the BFE, an effective measure of increasing a structure’s resistance to flooding</td>
</tr>
<tr>
<td></td>
<td>2012 IRC Section R322</td>
<td>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)</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>City of McAllen does not specify requirements for impact-resistant roofing for residential structures</td>
<td>The 2012 IRC does not contain provisions regarding impact-resistant roofing; roof coverings are a major element often damaged by hail.</td>
<td>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</td>
</tr>
<tr>
<td>R110 Certificate of Occupancy (C.O.)</td>
<td>City of McAllen has not amended Section R110.1</td>
<td>2012 IRC Section R110.1 provides that the building official must issue a C.O. before occupancy or change in use</td>
<td>Continue requirement of C.O. to increase likelihood that the dwelling may be safety occupied and is constructed to code</td>
</tr>
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**2012 International Residential Code**
City of McAllen: Substantial Amendment Changes, Impacts & Recommendations – Technical Notes*

1) Amendment 1 Impact

Flooding is one of the top three weather perils McAllen faces as identified by the National Weather Service. City of McAllen floodplain regulations do not specify any elevation of the lowest floor (including basement) 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.

2) Provision 2 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. Hail is one of the top three weather perils McAllen faces as identified by the National Weather Service.

3) Provision 3 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.

*The City of McAllen’s only amendments were to appendices of the 2012 IRC
6/22/15 Version – City of McAllen/Hidalgo County Texas Leadership Toolkit
Average Texas Home Profile

Approximately 2850 square feet
Median price $197,000

Current Residential Practices for Homes Built in City of McAllen

- Roof deck typically 7/16" OSB or plywood
- Built to 2012 IRC with amendments
- No freeboard currently
- No specific requirement for impact-resistant roof covering

Recommended New or Retrofit Construction for Weather-Ready Homes

- Impact-resistant roof covering with a rating of Class 3 or 4 per UL 2218 or FM 4473
- Examples of Amendment Profile Layout Recommendations
- Freeboard 12" or more from base flood elevation to the first floor of the residence
How does the City of McAllen/Hidalgo County Rate on Building Code Enforcement?
(The lower the class number is, the more favorable the rating)

The City of McAllen’s BCEGS® rating is: 3

Hidalgo 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 Hidalgo 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 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, tornadoes, 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.
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 Mitigation Incentives document included in this Toolkit.

Resources

Texas

- Texas Department of Public Safety, Division of Emergency Management, http://www.txdps.state.tx.us/dem/index.htm
- City of McAllen’s Emergency Operations Center, http://www.mcallen.net/emergency-management
- Building Officials Association of Texas, http://www.boatx.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/

Other

- 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 Sciences Branch: http://www.fema.gov/protecting-homes
  - FEMA Helpline: BuildingScienceHelp@fema.dhs.gov
- International Code Council (ICC)