



Home Innovation
RESEARCH LABS™

National Survey of
Home Builder
Interest in Resiliency

Prepared For

**NATIONAL ASSOCIATION OF HOME BUILDERS
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TABLE OF CONTENTS

BACKGROUND	1
OVERALL SUMMARY OF FINDINGS	2
DETAILED FINDINGS FROM NATIONWIDE SURVEY AMONG HOME BUILDERS	3
Required “Enhanced” Disaster-Resistant Provisions and Eligible Incentives	3
Construction Practices for Mitigation and Resilience.....	10
Common Construction Practices for Mitigation and Resilience	11
Construction Practices Not Done for Mitigation and Resilience	12
QUESTIONNAIRE	44

BACKGROUND

The unusual number of significant natural disasters occurring over the past few years, coupled with ongoing concerns over the effects of climate change, have prompted action at every level of government to increase the resiliency of communities, infrastructure, and buildings. The resiliency plans, policies and programs that have been put into place and those under consideration will significantly impact how and where new homes and communities are built and greatly influence how existing structures and cities are reengineered, rebuilt and/or remodeled.

To respond to these challenges, NAHB established a Resiliency Working Group to provide advice and oversight regarding NAHB's policy, strategy and tactics for addressing the full and integrated range of resiliency issues and to ensure NAHB is taking a comprehensive and coordinated approach. The Working Group developed a comprehensive strategy to guide NAHB's efforts to ensure any initiatives related to resiliency do not adversely impact the housing industry or NAHB's members' ability to provide safe, decent, and affordable housing in all areas of the country.

As part of this strategy, NAHB's Construction Technology Research Subcommittee commissioned Home Innovation Research Labs to conduct a nationwide survey among home builders, using Home Innovation's research panel.

OVERALL SUMMARY OF FINDINGS

Some home builders are using “enhanced” construction practices to build homes that are more resilient and less susceptible to damage from various natural disasters. But among the “enhanced” measures asked about, most that are currently practiced are mandatory. And most home builders report they are unlikely to incorporate many other “enhanced” construction practices. For some home builders, this is likely because they don’t build in areas prone to the natural disasters that would warrant certain “enhanced” practices.

Roughly a third or fewer home builders report needing to adhere to state and local ordinances for enhanced construction, floodplain management requirements and/or seismic retrofit ordinances. Most of the mitigation and resilience construction practices queried in this research are not done by the majority of home builders. And, nearly a third to well over half of home builders report they are unlikely to do most of these construction practices on a voluntary basis. Additionally, state and local incentives to encourage resilient construction practices do not appear to be widely available.

DETAILED FINDINGS FROM NATIONWIDE SURVEY AMONG HOME BUILDERS

A nationwide sample of 402 home builders, from Home Innovation’s panel of home builders, was asked which “enhanced” disaster-resistant provisions they are required to do, and what types of incentives their projects have been eligible for, during the past 5 years. The sample includes a cross-section of local, regional, and national single-family, multifamily, custom and production home builders from 47 states.

Required “Enhanced” Disaster-Resistant Provisions and Eligible Incentives

More than anything else, home builders are required to adhere to local ordinances, followed by floodplain management requirements.

- A little more than a third of total US home builders report they are required to abide by state and local ordinances for enhanced construction; more so in states at risk of hurricanes, and in the Northeast and South.
- More than a third of home builders in the West say they are required to adhere to state and local ordinances for seismic retrofits, compared to less than one in five in the Northeast, and even fewer in the Midwest and South.
- About one in four US home builders say they are required to follow enhanced floodplain management requirements.
- One in ten or fewer home builders across the US say they are required to follow any of the other specific provisions asked about: state appendix for disaster-resistant construction, NFPA Firewise Community criteria, IBHS Fortified criteria.
- There were effectively no other required “enhanced” disaster-resistant provisions mentioned; many said they were NOT required to do any of the provisions asked about.

(See tables B1-B5.)

There do not appear to be many incentives to encourage resilient construction practices. For example:

- Nearly half of all US home builders said they had not completed any projects during the past 5 years that were eligible for any incentives.
- Less than a fifth of all US home builders had completed projects eligible for incentives from private retrofit grant programs during the past 5 years, with home builders in the Northeast and Midwest the most eligible for these grants.
- Even fewer home builders had projects eligible for most other incentives queried.
- Home builders in the West were most likely to have projects eligible for state retrofit grant programs and state-mandated tax credits, as were those who build in states at risk of earthquakes and wildfires.
- Home builders in the South were most likely to have projects eligible for state-mandated insurance discounts, as were those who build in states at risk of hurricanes.

(See tables B6-B10.)

Table B1. Required Disaster Resistant Provisions: Region

	Total US	US CENSUS REGION			
		Northeast	South	Midwest	West
Base: Total Respondents	(402)	(67)	(163)	(119)	(53)
Required Provisions	%	%	%	%	%
Local ordinance for enhanced construction (e.g. Moore, OK minimum requirements for high wind resistance)	37	43	40	33	30
Enhanced floodplain management requirements (i.e. NFIP Community Rating System)	26	22	28	24	26
Local ordinance for seismic retrofit (e.g. soft-story, cripple walls, unreinforced brick)	14	18	7	9	38
State appendix for disaster-resistant construction (e.g. GA Disaster Resilient IRC Appendix)	10	6	9	13	15
NFPA Firewise Community criteria	9	13	6	9	17
IBHS Fortified criteria	6	4	4	8	9
Other	3	-	4	4	6
None of these	40	39	39	46	32

Table B2. Required Disaster Resistant Provisions: States at risk of Tornadoes & Hail

	Total US	BUILD IN STATES AT RISK OF:			
		TORNADOES		HAIL	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(180)	(222)	(82)	(320)
Required Provisions	%	%	%	%	%
Local ordinance for enhanced construction (e.g. Moore, OK minimum requirements for high wind resistance)	37	36	38	41	36
Enhanced floodplain management requirements (i.e. NFIP Community Rating System)	26	27	24	22	27
Local ordinance for seismic retrofit (e.g. soft-story, cripple walls, unreinforced brick)	14	9	18	7	15
State appendix for disaster-resistant construction (e.g. GA Disaster Resilient IRC Appendix)	10	9	11	11	10
NFPA Firewise Community criteria	9	8	11	7	10
IBHS Fortified criteria	6	7	5	7	6
Other	3	3	4	2	4
None of these	40	41	40	43	40

Table B3. Required Disaster Resistant Provisions: States at risk of Earthquakes & Wildfires

	Total US	BUILD IN STATES AT RISK OF:			
		EARTHQUAKES		WILDFIRE	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(91)	(311)	(84)	(318)
Required Provisions	%	%	%	%	%
Local ordinance for enhanced construction (e.g. Moore, OK minimum requirements for high wind resistance)	37	25	41	37	37
Enhanced floodplain management requirements (i.e. NFIP Community Rating System)	26	24	26	24	26
Local ordinance for seismic retrofit (e.g. soft-story, cripple walls, unreinforced brick)	14	29	9	25	11
State appendix for disaster-resistant construction (e.g. GA Disaster Resilient IRC Appendix)	10	9	11	11	10
NFPA Firewise Community criteria	9	9	10	12	9
IBHS Fortified criteria	6	7	6	7	6
Other	3	4	3	4	3
None of these	40	41	40	36	42

Table B4. Required Disaster Resistant Provisions: States at risk of Hurricanes & Floods

	Total US	BUILD IN STATES AT RISK OF:			
		HURRICANES		FLOODS	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(189)	(213)	(196)	(206)
Required Provisions	%	%	%	%	%
Local ordinance for enhanced construction (e.g. Moore, OK minimum requirements for high wind resistance)	37	43	32	41	34
Enhanced floodplain management requirements (i.e. NFIP Community Rating System)	26	28	23	24	27
Local ordinance for seismic retrofit (e.g. soft-story, cripple walls, unreinforced brick)	14	8	19	15	12
State appendix for disaster-resistant construction (e.g. GA Disaster Resilient IRC Appendix)	10	10	11	10	11
NFPA Firewise Community criteria	9	8	11	9	10
IBHS Fortified criteria	6	4	8	5	7
Other	3	3	4	3	4
None of these	40	39	42	39	42

Table B5. Required Disaster Resistant Provisions: States at risk of Snowstorms

	Total US	BUILD IN STATES AT RISK OF:	
		SNOWSTORMS	
		YES	NO
Base: Total Respondents	(402)	(126)	(276)
Required Provisions	%	%	%
Local ordinance for enhanced construction (e.g. Moore, OK minimum requirements for high wind resistance)	37	35	38
Enhanced floodplain management requirements (i.e. NFIP Community Rating System)	26	24	26
Local ordinance for seismic retrofit (e.g. soft-story, cripple walls, unreinforced brick)	14	17	12
State appendix for disaster-resistant construction (e.g. GA Disaster Resilient IRC Appendix)	10	12	10
NFPA Firewise Community criteria	9	13	8
IBHS Fortified criteria	6	8	5
Other	3	2	4
None of these	40	44	38

Table B6. Incentives Company Projects Eligible for Past 5 Years: Region

	Total US	US CENSUS REGION			
		Northeast	South	Midwest	West
Base: Total Respondents	(402)	(67)	(163)	(119)	(53)
Incentives	%	%	%	%	%
Private retrofit grant program	19	25	14	23	15
FEMA mitigation grants (e.g. Pre-Disaster Mitigation Program; Hazard Mitigation Grant Program)	14	16	13	15	11
State-mandated insurance discounts (e.g. discounts in AL, GA, MS, and NC for building to IBHS FORTIFIED criteria)	12	10	17	8	13
State-mandated tax credits (e.g. tax deductions for retrofits in AL and LA)	8	3	7	9	15
State retrofit grant program (e.g. Strengthen Alabama Homes, South Carolina Safe Home, or CA's Earthquake Brace+Bolt program)	5	1	3	1	23
Other incentive	7	6	7	7	6
None	46	48	48	46	40

Table B7. Incentives Company Projects Eligible for Past 5 Years: States at risk of Tornadoes & Hail

	Total US	BUILD IN STATES AT RISK OF:			
		TORNADOES		HAIL	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(180)	(222)	(82)	(320)
Incentives	%	%	%	%	%
Private retrofit grant program	19	19	18	22	18
FEMA mitigation grants (e.g. Pre-Disaster Mitigation Program; Hazard Mitigation Grant Program)	14	14	14	15	14
State-mandated insurance discounts (e.g. discounts in AL, GA, MS, and NC for building to IBHS FORTIFIED criteria)	12	9	15	9	13
State-mandated tax credits (e.g. tax deductions for retrofits in AL and LA)	8	9	7	4	9
State retrofit grant program (e.g. Strengthen Alabama Homes, South Carolina Safe Home, or CA's Earthquake Brace+Bolt program)	5	1	8	2	5

Table B8. Incentives Company Projects Eligible for Past 5 Years: States at risk of Earthquakes & Wildfires

	Total US	BUILD IN STATES AT RISK OF:			
		EARTHQUAKES		WILDFIRE	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(91)	(311)	(84)	(318)
Incentives	%	%	%	%	%
Private retrofit grant program	19	20	18	14	20
FEMA mitigation grants (e.g. Pre-Disaster Mitigation Program; Hazard Mitigation Grant Program)	14	11	15	13	14
State-mandated insurance discounts (e.g. discounts in AL, GA, MS, and NC for building to IBHS FORTIFIED criteria)	12	8	14	13	12
State-mandated tax credits (e.g. tax deductions for retrofits in AL and LA)	8	12	7	10	8
State retrofit grant program (e.g. Strengthen Alabama Homes, South Carolina Safe Home, or CA's Earthquake Brace+Bolt program)	5	13	2	14	2

Table B9. Incentives Company Projects Eligible for Past 5 Years: States at risk of Hurricanes & Floods

	Total US	BUILD IN STATES AT RISK OF:			
		HURRICANES		FLOODS	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(189)	(213)	(196)	(206)
Incentives	%	%	%	%	%
Private retrofit grant program	19	17	20	19	18
FEMA mitigation grants (e.g. Pre-Disaster Mitigation Program; Hazard Mitigation Grant Program)	14	16	12	15	13
State-mandated insurance discounts (e.g. discounts in AL, GA, MS, and NC for building to IBHS FORTIFIED criteria)	12	16	9	14	11
State-mandated tax credits (e.g. tax deductions for retrofits in AL and LA)	8	6	10	7	9
State retrofit grant program (e.g. Strengthen Alabama Homes, South Carolina Safe Home, or CA's Earthquake Brace+Bolt program)	5	3	6	8	2

Table B10. Incentives Company Projects Eligible for Past 5 Years: States at risk of Snowstorms

	Total US	BUILD IN STATES AT RISK OF:	
		SNOWSTORMS	
		YES	NO
Base: Total Respondents	(402)	(126)	(276)
Incentives	%	%	%
Private retrofit grant program	19	20	18
FEMA mitigation grants (e.g. Pre-Disaster Mitigation Program; Hazard Mitigation Grant Program)	14	11	15
State-mandated insurance discounts (e.g. discounts in AL, GA, MS, and NC for building to IBHS FORTIFIED criteria)	12	11	13
State-mandated tax credits (e.g. tax deductions for retrofits in AL and LA)	8	8	8
State retrofit grant program (e.g. Strengthen Alabama Homes, South Carolina Safe Home, or CA's Earthquake Brace+Bolt program)	5	2	6

Construction Practices for Mitigation and Resilience

Home builders were asked to review a randomized list of 20 construction practices (listed below) and tell us whether each practice is something their company does mandatorily (required by code, ordinance or local jurisdiction) or voluntarily, and if not, whether it is something they would consider.

	PRACTICES—Full Statements	PRACTICES—Truncated for Report
1	Anchor freestanding appliances such as refrigerators, washing machines and dryers to the wall to minimize damage in earthquakes	Anchor appliances to wall to minimize earthquake damage
2	Brace or anchor homes on steep sites (i.e. hillside homes) to prevent them from sliding during a heavy rain or earthquake	Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake
3	Brace gable end walls and/or roof projections such as dormers or skylights to prevent damage or failure due to earthquakes or high winds	Brace gable end walls/roof projections to protect from earthquakes/high winds
4	Build above the base flood elevation (BFE) by more than one foot	Build above BFE by more than one foot
5	Elevate and secure outdoor HVAC equipment (e.g. compressors) to protect from damage due to flood or high winds	Elevate & secure outdoor HVAC equipment to protect from flood/high winds
6	Elevate and secure water heaters to protect from damage due to earthquake, flood, or high winds	Elevate & secure water heaters to protect from earthquake/flood/high winds
7	Flash AND seal all roof and wall penetrations (e.g. chimneys, vents, pipes) to protect against heavy or wind-driven rain	Flash & seal roof & walls to protect from wind-driven rain
8	Improve window and door flashing/sealing by using pan flashing	Improve window & door flashing/sealing with pan flashing
9	Protect windows and sliding patio doors with hurricane shutters to prevent damage from flying debris due to a hurricane, tornado or other severe wind event	Protect windows & sliding patio doors from flying debris with hurricane shutters
10	Provide hurricane straps or clips at roof-to-wall, wall-to-wall, and wall-to-foundation connections to provide a continuous path to resist wind, floor and earthquake loads	Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads
11	Provide impact-resistant exterior doors to prevent damage from flying debris due to a hurricane, tornado or other severe wind event	Use impact-resistant doors to protect from flying debris
12	Reinforce double entry doors to prevent them from blowing open during high wind events	Reinforce double entry doors to protect from high winds
13	Reinforce garage doors to prevent them from being blown in due to high winds such as hurricanes or tornadoes	Reinforce garage doors to protect from high winds
14	Use Class A, B or C roofing materials or fire-retardant treated shakes or shingles	Use Class A, B or C roofing or fire-retardant treated roofing
15	Use crawlspace foundations or concrete/masonry piers to elevate a home above surrounding grade or above base flood elevation, instead of using fill to raise the home	Crawlspace foundations/concrete piers vs fill to raise home
16	Use high-wind-resistant (e.g. Class F or H asphalt shingles) or hail damage-resistant roofing materials	Use high-wind-resistant/hail damage-resistant roofing
17	Use high-wind-resistant siding, soffit and fascia products and/or tighter fastener and tie spacing	Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing
18	Use ignition-resistant building materials on the exterior of a house and/or fire-resistance-rated construction in states at risk of wildfires	Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires
19	Use landscaping features that help protect against wildfires, such as keeping vegetation away from the house, trimmed, pruned, and watered or keeping trees more than 10 feet apart and more than 10 feet from the home	Use landscaping features in states at risk of wildfires
20	Use solid core wood or fire-resistance-rated (20-minute minimum) windows or doors with fire-resistant glazing (e.g. tempered glass, glass block) in states at risk of wildfires	Use solid core wood or fire-resistance windows or doors in states at risk of wildfires

Common Construction Practices for Mitigation and Resilience

The most widespread practice is to **flash AND seal all roof and wall penetrations (e.g. chimneys, vents, pipes) to protect against heavy or wind-driven rain**. Overall, nearly nine of 10 US home builders do this, nearly half on a voluntary basis. This practice is more likely to be mandatory in the West and in states at risk of earthquakes and floods, and more likely to be done voluntarily in areas prone to tornadoes.

The next most common construction practice is to **provide hurricane straps or clips at roof-to-wall, wall-to-wall, and wall-to-foundation connections to provide a continuous path to resist wind, floor and earthquake loads**. Roughly 3 of 4 home builders do this, most because it is mandatory. This is more likely to be mandatory in states at risk of hurricanes, and more likely to be done voluntarily (versus mandatorily) in the Midwest and in states at risk of tornadoes and hail.

Another widespread practice is to **build above the base flood elevation (BFE) by more than one foot**. Overall, roughly 3 of 4 US home builders do this, primarily because it is mandatory. This is more likely to be mandatory in the South and in states at risk of hurricanes, and more likely to be done voluntarily (versus mandatorily) in the Midwest and areas prone to tornadoes and hail.

A clear majority of home builders also **improve window and door flashing/sealing by using pan flashing**. Nationwide, roughly two-thirds or more home builders do this, most on a voluntary basis.

Additionally, it is widespread practice to **brace gable end walls and/or roof projections such as dormers or skylights to prevent damage or failure due to earthquakes or high winds**. This is more likely to be mandatory in the South and West and in states at risk of hurricanes and floods. Home builders in the Midwest are more likely to do this voluntarily.

Across most of the country, many home builders (roughly half or somewhat fewer) also do the following, mostly on a voluntary basis.

- Use Class A, B or C roofing materials or fire-retardant treated shakes or shingles
- Use high-wind-resistant siding, soffit and fascia products and/or tighter fastener and tie spacing
- Use crawlspace foundations or concrete/masonry piers to elevate a home above surrounding grade or above base flood elevation, instead of using fill to raise the home
- Elevate and secure water heaters to protect from damage due to earthquake, flood, or high winds
- Use high-wind-resistant (e.g. Class F or H asphalt shingles) or hail damage-resistant roofing materials
- Elevate and secure outdoor HVAC equipment to protect from damage due to flood or high winds

In addition to the most common practices listed above, over half to 3 of 4 home builders in the West:

- Use Class A, B or C roofing materials or fire-retardant treated shakes or shingles;
- Elevate and secure water heaters to protect from damage due to earthquake, flood, or high winds;
- Brace or anchor homes on steep sites (i.e. hillside homes) to prevent them from sliding during a heavy rain or earthquake;
- Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires;
- Use landscaping features in states at risk of wildfires; and
- Use solid core wood or fire-resistance-rated (20-minute minimum) windows or doors with fire-resistant glazing (e.g. tempered glass, glass block) in states at risk of wildfires.

(See tables B11-B25.)

Construction Practices Not Done for Mitigation and Resilience

Other than the common practices identified in the previous section, across most of the country, clear majorities of home builders do **NOT** implement the construction practices listed below; and for the most part, they're not likely to consider doing them.

NOT CURRENTLY DONE, AND MOST WHO ARE NOT CURRENTLY DOING UNLIKELY TO CONSIDER

- Protect windows and sliding patio doors with hurricane shutters to prevent damage from flying debris due to a hurricane, tornado or other severe wind event—most not doing are unlikely to consider
- Anchor freestanding appliances such as refrigerators, washing machines and dryers to the wall to minimize damage in earthquakes—most not doing are unlikely to consider
- Use landscaping features in states at risk of wildfires—most not doing are unlikely to consider
- Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires—most not doing are unlikely to consider
- Brace or anchor homes on steep sites (i.e. hillside homes) to prevent them from sliding during a heavy rain or earthquake—most not doing are unlikely to consider
- Use solid core wood or fire-resistance-rated (20-minute minimum) windows or doors with fire-resistant glazing (e.g. tempered glass, glass block) in states at risk of wildfires—most not doing are unlikely to consider
- Elevate and secure water heaters to protect from damage due to earthquake, flood, or high winds—most not doing are unlikely to consider
- Use crawlspace foundations or concrete/masonry piers to elevate a home above surrounding grade or above base flood elevation, instead of using fill to raise the home—most not doing are unlikely to consider
- Reinforce garage doors to prevent them from being blown in due to high winds such as hurricanes or tornadoes—about half not doing are unlikely to consider

(See tables B26-B40.)

NOT CURRENTLY DONE, BUT MOST WHO ARE NOT CURRENTLY DOING WOULD CONSIDER

- Use high-wind-resistant siding, soffit and fascia products and/or tighter fastener and tie spacing—most not doing would consider
- Use high-wind-resistant (e.g. Class F or H asphalt shingles) or hail damage-resistant roofing materials—over half not doing would consider
- Reinforce double entry doors to prevent them from blowing open during high wind events—half not doing would consider
- Elevate and secure outdoor HVAC equipment (e.g. compressors) to protect from damage due to flood or high winds—half not doing would consider
- Provide impact-resistant exterior doors to prevent damage from flying debris due to a hurricane, tornado or other severe wind event—nearly half not doing would consider

(See tables B26-B40.)

Table B11. Mandatory/Voluntary Construction Practices DO (NET): Region

	US CENSUS REGION				
	Total US	Northeast	South	Midwest	West
Base: Total Respondents	(402)	(67)	(163)	(119)	(53)
Construction Practices	%	%	%	%	%
Flash & seal roof & walls to protect from wind-driven rain	88	87	87	91	85
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	76	75	75	81	72
Build above BFE by more than one foot	76	66	82	77	66
Improve window & door flashing/sealing with pan flashing	69	73	64	72	70
Brace gable end walls/roof projections to protect from earthquakes/high winds	64	49	66	66	70
Use Class A, B or C roofing or fire-retardant treated roofing	51	45	46	52	75
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	47	36	52	45	49
Crawlspace foundations/concrete piers vs fill to raise home	45	42	47	43	49
Elevate & secure water heaters to protect from earthquake/flood/high winds	44	43	46	31	70
Use high-wind-resistant/hail damage-resistant roofing	43	40	43	47	40
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	42	45	44	35	47
Reinforce garage doors to protect from high winds	40	31	44	46	26
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	38	28	30	47	57
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	37	39	29	32	74
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	35	21	35	30	66
Reinforce double entry doors to protect from high winds	34	27	36	34	42
Use impact-resistant doors to protect from flying debris	33	25	40	31	28
Use landscaping features in states at risk of wildfires.	29	22	23	25	64
Anchor appliances to wall to minimize earthquake damage	21	19	16	22	36
Protect windows & sliding patio doors from flying debris with hurricane shutters	18	22	24	11	13

Table B12. Mandatory/Voluntary Construction Practices DO (NET): States at risk of Tornadoes & Hail

	Total US	BUILD IN STATES AT RISK OF:			
		TORNADOES		HAIL	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(180)	(222)	(82)	(320)
Construction Practices	%	%	%	%	%
Flash & seal roof & walls to protect from wind-driven rain	88	89	86	87	88
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	76	74	78	62	80
Build above BFE by more than one foot	76	78	74	74	76
Improve window & door flashing/sealing with pan flashing	69	67	71	61	71
Brace gable end walls/roof projections to protect from earthquakes/high winds	64	65	63	61	64
Use Class A, B or C roofing or fire-retardant treated roofing	51	49	53	50	52
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	47	48	45	51	46
Crawlspace foundations/concrete piers vs fill to raise home	45	42	47	34	48
Elevate & secure water heaters to protect from earthquake/flood/high winds	44	37	50	33	47
Use high-wind-resistant/hail damage-resistant roofing	43	43	44	40	44
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	42	37	46	28	46
Reinforce garage doors to protect from high winds	40	43	38	48	38
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	38	42	36	40	38
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	37	30	43	33	38
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	35	35	36	43	33
Reinforce double entry doors to protect from high winds	34	32	36	29	36
Use impact-resistant doors to protect from flying debris	33	33	34	33	33
Use landscaping features in states at risk of wildfires	29	24	33	24	30
Anchor appliances to wall to minimize earthquake damage	21	19	22	18	22
Protect windows & sliding patio doors from flying debris with hurricane shutters	18	14	22	15	19

Table B13. Mandatory/Voluntary Construction Practices DO (NET): States at risk of Earthquakes & Wildfires

	Total US	BUILD IN STATES AT RISK OF:			
		EARTHQUAKES		WILDFIRES	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(91)	(311)	(84)	(318)
Construction Practices	%	%	%	%	%
Flash & seal roof & walls to protect from wind-driven rain	88	91	87	83	89
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	76	77	76	63	80
Build above BFE by more than one foot	76	73	77	70	77
Improve window & door flashing/sealing with pan flashing	69	75	67	62	71
Brace gable end walls/roof projections to protect from earthquakes/high winds	64	68	62	65	63
Use Class A, B or C roofing or fire-retardant treated roofing	51	57	50	65	48
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	47	46	47	51	46
Crawlspace foundations/concrete piers vs fill to raise home	45	51	43	39	47
Elevate & secure water heaters to protect from earthquake/flood/high winds	44	55	41	62	40
Use high-wind-resistant/hail damage-resistant roofing	43	40	44	36	45
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	42	45	41	38	43
Reinforce garage doors to protect from high winds	40	33	42	29	43
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	38	46	36	43	37
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	37	56	32	56	32
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	35	44	33	60	29
Reinforce double entry doors to protect from high winds	34	34	34	37	34
Use impact-resistant doors to protect from flying debris	33	30	34	29	35
Use landscaping features in states at risk of wildfires	29	42	25	46	25
Anchor appliances to wall to minimize earthquake damage	21	30	18	26	19
Protect windows & sliding patio doors from flying debris with hurricane shutters	18	14	20	13	20

Table B14. Mandatory/Voluntary Construction Practices DO (NET): States at risk of Hurricanes & Floods

	Total US	BUILD IN STATES AT RISK OF:			
		HURRICANES		FLOODS	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(189)	(213)	(196)	(206)
Construction Practices	%	%	%	%	%
Flash & seal roof & walls to protect from wind-driven rain	88	85	90	87	89
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	76	75	77	75	77
Build above BFE by more than one foot	76	79	73	78	74
Improve window & door flashing/sealing with pan flashing	69	63	74	68	69
Brace gable end walls/roof projections to protect from earthquakes/high winds	64	59	68	65	63
Use Class A, B or C roofing or fire-retardant treated roofing	51	45	57	52	51
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	47	46	47	52	42
Crawlspace foundations/concrete piers vs fill to raise home	45	45	45	50	40
Elevate & secure water heaters to protect from earthquake/flood/high winds	44	42	46	50	39
Use high-wind-resistant/hail damage-resistant roofing	43	41	45	44	42
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	42	44	40	49	35
Reinforce garage doors to protect from high winds	40	40	40	45	35
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	38	29	46	40	37
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	37	31	43	39	35
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	35	29	41	38	33
Reinforce double entry doors to protect from high winds	34	33	35	39	30
Use impact-resistant doors to protect from flying debris	33	36	31	42	25
Use landscaping features in states at risk of wildfires	29	23	34	30	28
Anchor appliances to wall to minimize earthquake damage	21	16	25	20	21
Protect windows & sliding patio doors from flying debris with hurricane shutters	18	25	13	27	11

Table B15. Mandatory/Voluntary Construction Practices DO (NET): States at risk of Snowstorms

	Total US	BUILD IN STATES AT RISK OF:	
		SNOWSTORMS	
		YES	NO
Base: Total Respondents	(402)	(126)	(276)
Construction Practices	%	%	%
Flash & seal roof & walls to protect from wind-driven rain	88	87	88
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	76	75	77
Build above BFE by more than one foot	76	67	80
Improve window & door flashing/sealing with pan flashing	69	70	68
Brace gable end walls/roof projections to protect from earthquakes/high winds	64	57	67
Use Class A, B or C roofing or fire-retardant treated roofing	51	54	50
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	47	38	51
Crawlspace foundations/concrete piers vs fill to raise home	45	39	48
Elevate & secure water heaters to protect from earthquake/flood/high winds	44	44	45
Use high-wind-resistant/hail damage-resistant roofing	43	43	43
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	42	40	43
Reinforce garage doors to protect from high winds	40	32	44
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	38	40	38
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	37	43	35
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	35	35	36
Reinforce double entry doors to protect from high winds	34	29	37
Use impact-resistant doors to protect from flying debris	33	25	37
Use landscaping features in states at risk of wildfires	29	32	28
Anchor appliances to wall to minimize earthquake damage	21	22	20
Protect windows & sliding patio doors from flying debris with hurricane shutters	18	14	20

Table B16. Mandatory Construction Practices DO: Region

	US CENSUS REGION				
	Total US	Northeast	South	Midwest	West
Base: Total Respondents	(402)	(67)	(163)	(119)	(53)
Construction Practices	%	%	%	%	%
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	59	66	60	55	55
Build above BFE by more than one foot	45	40	52	39	43
Flash & seal roof & walls to protect from wind-driven rain	39	34	39	37	49
Brace gable end walls/roof projections to protect from earthquakes/high winds	31	25	34	24	40
Elevate & secure water heaters to protect from earthquake/flood/high winds	21	18	23	6	53
Use Class A, B or C roofing or fire-retardant treated roofing	20	15	20	15	36
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	19	22	13	10	55
Reinforce garage doors to protect from high winds	18	10	26	18	4
Crawlspace foundations/concrete piers vs fill to raise home	17	21	18	17	9
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	17	7	13	18	38
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	16	19	23	4	17
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	11	10	11	7	25
Improve window & door flashing/sealing with pan flashing	10	10	7	13	15
Use impact-resistant doors to protect from flying debris	9	6	15	5	6
Use high-wind-resistant/hail damage-resistant roofing	9	10	10	7	8
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	9	9	7	3	26
Anchor appliances to wall to minimize earthquake damage	9	10	5	9	17
Reinforce double entry doors to protect from high winds	8	7	12	4	6
Protect windows & sliding patio doors from flying debris with hurricane shutters	7	9	13	1	2
Use landscaping features in states at risk of wildfires	6	3	4	3	25

Table B17. Mandatory Construction Practices DO: States at risk of Tornadoes & Hail

	Total US	BUILD IN STATES AT RISK OF:			
		TORNADOES		HAIL	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(180)	(222)	(82)	(320)
Construction Practices	%	%	%	%	%
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	59	49	67	38	64
Build above BFE by more than one foot	45	43	47	34	48
Flash & seal roof & walls to protect from wind-driven rain	39	33	44	30	41
Brace gable end walls/roof projections to protect from earthquakes/high winds	31	23	37	18	34
Elevate & secure water heaters to protect from earthquake/flood/high winds	21	11	29	5	25
Use Class A, B or C roofing or fire-retardant treated roofing	20	15	24	15	21
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	19	11	26	10	22
Reinforce garage doors to protect from high winds	18	16	20	18	18
Crawlspace foundations/concrete piers vs fill to raise home	17	15	18	7	19
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	17	16	18	17	17
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	16	8	22	2	19
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	11	7	15	10	12
Improve window & door flashing/sealing with pan flashing	10	9	11	4	12
Use impact-resistant doors to protect from flying debris	9	6	13	1	12
Use high-wind-resistant/hail damage-resistant roofing	9	6	12	5	10
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	9	5	12	4	10
Anchor appliances to wall to minimize earthquake damage	9	7	10	5	10
Reinforce double entry doors to protect from high winds	8	4	11	2	10
Protect windows & sliding patio doors from flying debris with hurricane shutters	7	2	11	-	9
Use landscaping features in states at risk of wildfires	6	2	9	1	7

Table B18. Mandatory Construction Practices DO: States at risk of Earthquakes & Wildfires

	Total US	BUILD IN STATES AT RISK OF:			
		EARTHQUAKES		WILDFIRES	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(91)	(311)	(84)	(318)
Construction Practices	%	%	%	%	%
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	59	57	59	43	63
Build above BFE by more than one foot	45	45	45	44	46
Flash & seal roof & walls to protect from wind-driven rain	39	51	36	39	39
Brace gable end walls/roof projections to protect from earthquakes/high winds	31	33	30	30	31
Elevate & secure water heaters to protect from earthquake/flood/high winds	21	38	16	37	17
Use Class A, B or C roofing or fire-retardant treated roofing	20	27	18	27	18
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	19	35	14	37	14
Reinforce garage doors to protect from high winds	18	13	19	6	21
Crawlspace foundations/concrete piers vs fill to raise home	17	16	17	7	19
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	17	29	14	27	14
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	16	18	15	12	17
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	11	18	10	18	10
Improve window & door flashing/sealing with pan flashing	10	12	10	11	10
Use impact-resistant doors to protect from flying debris	9	7	10	4	11
Use high-wind-resistant/hail damage-resistant roofing	9	8	9	5	10
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	9	16	7	19	6
Anchor appliances to wall to minimize earthquake damage	9	15	7	11	8
Reinforce double entry doors to protect from high winds	8	8	8	4	9
Protect windows & sliding patio doors from flying debris with hurricane shutters	7	4	8	1	9
Use landscaping features in states at risk of wildfires	6	14	4	15	3

Table B19. Mandatory Construction Practices DO: States at risk of Hurricanes & Floods

	Total US	BUILD IN STATES AT RISK OF:			
		HURRICANES		FLOODS	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(189)	(213)	(196)	(206)
Construction Practices	%	%	%	%	%
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	59	66	52	61	56
Build above BFE by more than one foot	45	52	39	48	42
Flash & seal roof & walls to protect from wind-driven rain	39	41	38	46	33
Brace gable end walls/roof projections to protect from earthquakes/high winds	31	35	27	35	27
Elevate & secure water heaters to protect from earthquake/flood/high winds	21	22	20	24	17
Use Class A, B or C roofing or fire-retardant treated roofing	20	22	18	25	15
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	19	17	21	22	17
Reinforce garage doors to protect from high winds	18	23	13	24	12
Crawlspace foundations/concrete piers vs fill to raise home	17	19	15	20	14
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	17	13	21	19	15
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	16	25	8	24	8
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	11	12	11	16	7
Improve window & door flashing/sealing with pan flashing	10	9	11	9	11
Use impact-resistant doors to protect from flying debris	9	15	5	16	3
Use high-wind-resistant/hail damage-resistant roofing	9	12	6	13	5
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	9	8	9	11	7
Anchor appliances to wall to minimize earthquake damage	9	7	10	9	9
Reinforce double entry doors to protect from high winds	8	13	4	14	3
Protect windows & sliding patio doors from flying debris with hurricane shutters	7	14	1	13	2
Use landscaping features in states at risk of wildfires	6	4	8	7	5

Table B20. Mandatory Construction Practices DO: States at risk of Snowstorms

	Total US	BUILD IN STATES AT RISK OF:	
		SNOWSTORMS	
		YES	NO
Base: Total Respondents	(402)	(126)	(276)
Construction Practices	%	%	%
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	59	60	58
Build above BFE by more than one foot	45	38	49
Flash & seal roof & walls to protect from wind-driven rain	39	36	41
Brace gable end walls/roof projections to protect from earthquakes/high winds	31	27	32
Elevate & secure water heaters to protect from earthquake/flood/high winds	21	19	22
Use Class A, B or C roofing or fire-retardant treated roofing	20	18	21
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	19	22	18
Reinforce garage doors to protect from high winds	18	8	22
Crawlspace foundations/concrete piers vs fill to raise home	17	14	18
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	17	14	18
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	16	11	18
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	11	10	12
Improve window & door flashing/sealing with pan flashing	10	13	9
Use impact-resistant doors to protect from flying debris	9	4	12
Use high-wind-resistant/hail damage-resistant roofing	9	8	9
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	9	9	9
Anchor appliances to wall to minimize earthquake damage	9	10	8
Reinforce double entry doors to protect from high winds	8	4	10
Protect windows & sliding patio doors from flying debris with hurricane shutters	7	4	9
Use landscaping features in states at risk of wildfires	6	9	5

Table B21. Construction Practices DO Voluntarily: Region

	US CENSUS REGION				
	Total US	Northeast	South	Midwest	West
Base: Total Respondents	(402)	(67)	(163)	(119)	(53)
Construction Practices	%	%	%	%	%
Improve window & door flashing/sealing with pan flashing	59	63	58	60	55
Flash & seal roof & walls to protect from wind-driven rain	49	52	48	54	36
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	35	25	40	39	25
Use high-wind-resistant/hail damage-resistant roofing	34	30	33	40	32
Brace gable end walls/roof projections to protect from earthquakes/high winds	33	24	32	41	30
Use Class A, B or C roofing or fire-retardant treated roofing	32	30	26	37	40
Build above BFE by more than one foot	31	25	30	38	23
Crawlspace foundations/concrete piers vs fill to raise home	28	21	29	26	40
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	26	12	28	27	40
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	26	25	21	31	30
Reinforce double entry doors to protect from high winds	26	19	23	29	36
Use impact-resistant doors to protect from flying debris	24	19	25	26	23
Elevate & secure water heaters to protect from earthquake/flood/high winds	23	25	23	25	17
Use landscaping features in states at risk of wildfires	23	19	20	23	40
Reinforce garage doors to protect from high winds	22	21	18	29	23
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	21	21	17	29	19
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	18	16	16	22	19
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	17	9	15	25	17
Anchor appliances to wall to minimize earthquake damage	12	9	11	13	19
Protect windows & sliding patio doors from flying debris with hurricane shutters	11	13	11	10	11

Table B22. Construction Practices DO Voluntarily: States at risk of Tornadoes & Hail

	Total US	BUILD IN STATES AT RISK OF:			
		TORNADOES		HAIL	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(180)	(222)	(82)	(320)
Construction Practices	%	%	%	%	%
Improve window & door flashing/sealing with pan flashing	59	57	60	57	59
Flash & seal roof & walls to protect from wind-driven rain	49	56	43	56	47
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	35	42	30	41	34
Use high-wind-resistant/hail damage-resistant roofing	34	37	32	35	34
Brace gable end walls/roof projections to protect from earthquakes/high winds	33	42	26	43	31
Use Class A, B or C roofing or fire-retardant treated roofing	32	34	29	35	31
Build above BFE by more than one foot	31	34	27	40	28
Crawlspace foundations/concrete piers vs fill to raise home	28	27	29	27	28
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	26	30	23	39	23
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	26	28	24	26	26
Reinforce double entry doors to protect from high winds	26	28	25	27	26
Use impact-resistant doors to protect from flying debris	24	27	21	32	22
Elevate & secure water heaters to protect from earthquake/flood/high winds	23	26	21	28	22
Use landscaping features in states at risk of wildfires	23	23	23	23	23
Reinforce garage doors to protect from high winds	22	27	18	29	20
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	21	26	18	23	21
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	18	19	17	23	17
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	17	25	11	24	16
Anchor appliances to wall to minimize earthquake damage	12	12	12	13	12
Protect windows & sliding patio doors from flying debris with hurricane shutters	11	12	11	15	10

Table B23. Construction Practices DO Voluntarily: States at risk of Earthquakes & Wildfires

	Total US	BUILD IN STATES AT RISK OF:			
		EARTHQUAKES		WILDFIRES	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(91)	(311)	(84)	(318)
Construction Practices	%	%	%	%	%
Improve window & door flashing/sealing with pan flashing	59	63	58	51	61
Flash & seal roof & walls to protect from wind-driven rain	49	41	51	44	50
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	35	29	37	33	36
Use high-wind-resistant/hail damage-resistant roofing	34	32	35	31	35
Brace gable end walls/roof projections to protect from earthquakes/high winds	33	35	32	36	32
Use Class A, B or C roofing or fire-retardant treated roofing	32	30	32	38	30
Build above BFE by more than one foot	31	27	32	26	32
Crawlspace foundations/concrete piers vs fill to raise home	28	34	26	32	27
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	26	27	26	40	23
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	26	27	26	26	26
Reinforce double entry doors to protect from high winds	26	26	26	33	24
Use impact-resistant doors to protect from flying debris	24	23	24	25	24
Elevate & secure water heaters to protect from earthquake/flood/high winds	23	16	25	25	23
Use landscaping features in states at risk of wildfires	23	27	22	31	21
Reinforce garage doors to protect from high winds	22	20	23	23	22
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	21	18	23	15	23
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	18	21	17	19	18
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	17	20	17	20	17
Anchor appliances to wall to minimize earthquake damage	12	14	12	15	11
Protect windows & sliding patio doors from flying debris with hurricane shutters	11	10	12	12	11

Table B24. Construction Practices DO Voluntarily: States at risk of Hurricanes & Floods

	Total US	BUILD IN STATES AT RISK OF:			
		HURRICANES		FLOODS	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(189)	(213)	(196)	(206)
Construction Practices	%	%	%	%	%
Improve window & door flashing/sealing with pan flashing	59	54	62	59	58
Flash & seal roof & walls to protect from wind-driven rain	49	44	53	41	56
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	35	34	37	36	34
Use high-wind-resistant/hail damage-resistant roofing	34	29	39	32	37
Brace gable end walls/roof projections to protect from earthquakes/high winds	33	24	41	30	36
Use Class A, B or C roofing or fire-retardant treated roofing	32	23	39	27	36
Build above BFE by more than one foot	31	26	34	30	32
Crawlspace foundations/concrete piers vs fill to raise home	28	26	30	30	27
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	26	21	31	27	26
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	26	19	32	25	27
Reinforce double entry doors to protect from high winds	26	21	31	25	27
Use impact-resistant doors to protect from flying debris	24	21	26	26	22
Elevate & secure water heaters to protect from earthquake/flood/high winds	23	21	26	26	21
Use landscaping features in states at risk of wildfires	23	19	27	23	23
Reinforce garage doors to protect from high winds	22	16	27	21	23
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	21	16	26	21	22
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	18	14	22	17	19
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	17	9	25	14	21
Anchor appliances to wall to minimize earthquake damage	12	8	15	12	13
Protect windows & sliding patio doors from flying debris with hurricane shutters	11	11	12	14	9

Table B25. Construction Practices DO Voluntarily: States at risk of Snowstorms

	Total US	BUILD IN STATES AT RISK OF:	
		SNOWSTORMS	
		YES	NO
Base: Total Respondents	(402)	(126)	(276)
Construction Practices	%	%	%
Improve window & door flashing/sealing with pan flashing	59	56	60
Flash & seal roof & walls to protect from wind-driven rain	49	51	48
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	35	28	39
Use high-wind-resistant/hail damage-resistant roofing	34	35	34
Brace gable end walls/roof projections to protect from earthquakes/high winds	33	30	34
Use Class A, B or C roofing or fire-retardant treated roofing	32	36	30
Build above BFE by more than one foot	31	29	32
Crawlspace foundations/concrete piers vs fill to raise home	28	25	30
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	26	26	26
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	26	29	25
Reinforce double entry doors to protect from high winds	26	25	26
Use impact-resistant doors to protect from flying debris	24	21	25
Elevate & secure water heaters to protect from earthquake/flood/high winds	23	25	23
Use landscaping features in states at risk of wildfires	23	23	23
Reinforce garage doors to protect from high winds	22	24	21
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	21	25	20
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	18	21	17
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	17	14	19
Anchor appliances to wall to minimize earthquake damage	12	12	12
Protect windows & sliding patio doors from flying debris with hurricane shutters	11	10	12

Table B26. Construction Practices NOT DONE (NET): Region

	Total US	US CENSUS REGION			
		Northeast	South	Midwest	West
Base: Total Respondents	(402)	(67)	(163)	(119)	(53)
Construction Practices	%	%	%	%	%
Protect windows & sliding patio doors from flying debris with hurricane shutters	82	78	76	89	87
Anchor appliances to wall to minimize earthquake damage	79	81	84	78	64
Use landscaping features in states at risk of wildfires	71	78	77	75	36
Use impact-resistant doors to protect from flying debris	67	75	60	69	72
Reinforce double entry doors to protect from high winds	66	73	64	66	58
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	65	79	65	70	34
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	63	61	71	68	26
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	62	72	70	53	43
Reinforce garage doors to protect from high winds	60	69	56	54	74
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	58	55	56	65	53
Use high-wind-resistant/hail damage-resistant roofing	57	60	57	53	60
Elevate & secure water heaters to protect from earthquake/flood/high winds	56	57	54	69	30
Crawlspace foundations/concrete piers vs fill to raise home	55	58	53	57	51
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	53	64	48	55	51
Use Class A, B or C roofing or fire-retardant treated roofing	49	55	54	48	25
Brace gable end walls/roof projections to protect from earthquakes/high winds	36	51	34	34	30
Improve window & door flashing/sealing with pan flashing	31	27	36	28	30
Build above BFE by more than one foot	24	34	18	23	34
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	24	25	25	19	28
Flash & seal roof & walls to protect from wind-driven rain	12	13	13	9	15

Table B27. Construction Practices NOT DONE (NET): States at risk of Tornadoes & Hail

	Total US	BUILD IN STATES AT RISK OF:			
		TORNADOES		HAIL	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(180)	(222)	(82)	(320)
Construction Practices	%	%	%	%	%
Protect windows & sliding patio doors from flying debris with hurricane shutters	82	86	78	85	81
Anchor appliances to wall to minimize earthquake damage	79	81	78	82	78
Use landscaping features in states at risk of wildfires	71	76	67	76	70
Use impact-resistant doors to protect from flying debris	67	67	66	67	67
Reinforce double entry doors to protect from high winds	66	68	64	71	64
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	65	65	64	57	67
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	63	70	57	67	62
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	62	58	64	60	62
Reinforce garage doors to protect from high winds	60	57	62	52	62
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	58	63	54	72	54
Use high-wind-resistant/hail damage-resistant roofing	57	57	56	60	56
Elevate & secure water heaters to protect from earthquake/flood/high winds	56	63	50	67	53
Crawlspace foundations/concrete piers vs fill to raise home	55	58	53	66	52
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	53	52	55	49	54
Use Class A, B or C roofing or fire-retardant treated roofing	49	51	47	50	48
Brace gable end walls/roof projections to protect from earthquakes/high winds	36	35	37	39	36
Improve window & door flashing/sealing with pan flashing	31	33	29	39	29
Build above BFE by more than one foot	24	22	26	26	24
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	24	26	22	38	20
Flash & seal roof & walls to protect from wind-driven rain	12	11	14	13	12

Table B28. Construction Practices NOT DONE (NET): States at risk of Earthquakes & Wildfires

	Total US	BUILD IN STATES AT RISK OF:			
		EARTHQUAKES		WILDFIRES	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(91)	(311)	(84)	(318)
Construction Practices	%	%	%	%	%
Protect windows & sliding patio doors from flying debris with hurricane shutters	82	86	80	87	80
Anchor appliances to wall to minimize earthquake damage	79	70	82	74	81
Use landscaping features in states at risk of wildfires	71	58	75	54	75
Use impact-resistant doors to protect from flying debris	67	70	66	71	65
Reinforce double entry doors to protect from high winds	66	66	66	63	66
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	65	56	67	40	71
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	63	44	68	44	68
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	62	54	64	57	63
Reinforce garage doors to protect from high winds	60	67	58	71	57
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	58	55	59	62	57
Use high-wind-resistant/hail damage-resistant roofing	57	60	56	64	55
Elevate & secure water heaters to protect from earthquake/flood/high winds	56	45	59	38	60
Crawlspace foundations/concrete piers vs fill to raise home	55	49	57	61	53
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	53	54	53	49	54
Use Class A, B or C roofing or fire-retardant treated roofing	49	43	50	35	52
Brace gable end walls/roof projections to protect from earthquakes/high winds	36	32	38	35	37
Improve window & door flashing/sealing with pan flashing	31	25	33	38	29
Build above BFE by more than one foot	24	27	23	30	23
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	24	23	24	37	20
Flash & seal roof & walls to protect from wind-driven rain	12	9	13	17	11

Table B29. Construction Practices NOT DONE (NET): States at risk of Hurricanes & Floods

	Total US	BUILD IN STATES AT RISK OF:			
		HURRICANES		FLOODS	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(189)	(213)	(196)	(206)
Construction Practices	%	%	%	%	%
Protect windows & sliding patio doors from flying debris with hurricane shutters	82	75	87	73	89
Anchor appliances to wall to minimize earthquake damage	79	84	75	80	79
Use landscaping features in states at risk of wildfires	71	77	66	70	72
Use impact-resistant doors to protect from flying debris	67	64	69	58	75
Reinforce double entry doors to protect from high winds	66	67	65	61	70
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	65	71	59	62	67
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	63	69	57	61	65
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	62	71	54	60	63
Reinforce garage doors to protect from high winds	60	60	60	55	65
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	58	56	60	51	65
Use high-wind-resistant/hail damage-resistant roofing	57	59	55	56	58
Elevate & secure water heaters to protect from earthquake/flood/high winds	56	58	54	50	61
Crawlspace foundations/concrete piers vs fill to raise home	55	55	55	50	60
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	53	54	53	48	58
Use Class A, B or C roofing or fire-retardant treated roofing	49	55	43	48	49
Brace gable end walls/roof projections to protect from earthquakes/high winds	36	41	32	35	37
Improve window & door flashing/sealing with pan flashing	31	37	26	32	31
Build above BFE by more than one foot	24	21	27	22	26
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	24	25	23	25	23
Flash & seal roof & walls to protect from wind-driven rain	12	15	10	13	11

Table B30. Construction Practices NOT DONE (NET): States at risk of Snowstorms

	Total US	BUILD IN STATES AT RISK OF:	
		SNOWSTORMS	
		YES	NO
Base: Total Respondents	(402)	(126)	(276)
Construction Practices	%	%	%
Protect windows & sliding patio doors from flying debris with hurricane shutters	82	86	80
Anchor appliances to wall to minimize earthquake damage	79	78	80
Use landscaping features in states at risk of wildfires	71	68	72
Use impact-resistant doors to protect from flying debris	67	75	63
Reinforce double entry doors to protect from high winds	66	71	63
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	65	65	64
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	63	57	65
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	62	60	62
Reinforce garage doors to protect from high winds	60	68	56
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	58	60	57
Use high-wind-resistant/hail damage-resistant roofing	57	57	57
Elevate & secure water heaters to protect from earthquake/flood/high winds	56	56	55
Crawlspace foundations/concrete piers vs fill to raise home	55	61	52
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	53	62	49
Use Class A, B or C roofing or fire-retardant treated roofing	49	46	50
Brace gable end walls/roof projections to protect from earthquakes/high winds	36	43	33
Improve window & door flashing/sealing with pan flashing	31	30	32
Build above BFE by more than one foot	24	33	20
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	24	25	23
Flash & seal roof & walls to protect from wind-driven rain	12	13	12

Table B31. Construction Practices Would Consider, BUT NOT DONE CURRENTLY: Region

	Total US	US CENSUS REGION			
		Northeast	South	Midwest	West
Base: Total Respondents	(402)	(67)	(163)	(119)	(53)
Construction Practices	%	%	%	%	%
Reinforce double entry doors to protect from high winds	33	36	31	33	36
Use impact-resistant doors to protect from flying debris	32	42	27	29	42
Use high-wind-resistant/hail damage-resistant roofing	32	34	31	33	32
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	31	37	28	32	28
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	29	30	29	27	30
Reinforce garage doors to protect from high winds	28	30	28	24	38
Use landscaping features in states at risk of wildfires	27	33	27	24	25
Anchor appliances to wall to minimize earthquake damage	25	30	21	18	45
Protect windows & sliding patio doors from flying debris with hurricane shutters	25	33	24	20	30
Use Class A, B or C roofing or fire-retardant treated roofing	25	25	25	28	21
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	25	30	23	25	23
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	23	24	21	29	13
Crawlspace foundations/concrete piers vs fill to raise home	23	34	23	18	19
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	22	31	24	13	25
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	21	28	21	23	9
Improve window & door flashing/sealing with pan flashing	20	16	21	20	21
Brace gable end walls/roof projections to protect from earthquakes/high winds	19	28	16	18	21
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	13	15	15	9	11
Build above BFE by more than one foot	11	18	7	8	19
Flash & seal roof & walls to protect from wind-driven rain	7	6	7	6	9

Table B32. Practices Would Consider, BUT NOT DONE CURRENTLY: States at risk of Tornadoes & Hail

	Total US	BUILD IN STATES AT RISK OF:			
		TORNADOES		HAIL	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(180)	(222)	(82)	(320)
Construction Practices	%	%	%	%	%
Reinforce double entry doors to protect from high winds	33	33	33	38	32
Use impact-resistant doors to protect from flying debris	32	31	33	34	32
Use high-wind-resistant/hail damage-resistant roofing	32	36	29	40	30
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	31	30	31	37	29
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	29	30	27	40	26
Reinforce garage doors to protect from high winds	28	27	29	32	28
Use landscaping features in states at risk of wildfires	27	26	27	35	24
Anchor appliances to wall to minimize earthquake damage	25	22	28	30	24
Protect windows & sliding patio doors from flying debris with hurricane shutters	25	22	27	27	25
Use Class A, B or C roofing or fire-retardant treated roofing	25	29	22	32	23
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	25	24	25	26	24
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	23	29	18	28	21
Crawlspace foundations/concrete piers vs fill to raise home	23	21	24	26	22
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	22	21	23	23	22
Elevate & secure water heaters to protect from earthquake/flood/high winds	21	25	18	30	19
Improve window & door flashing/sealing with pan flashing	20	23	18	26	19
Brace gable end walls/roof projections to protect from earthquakes/high winds	19	18	20	22	18
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	13	14	12	20	11
Build above BFE by more than one foot	11	8	14	11	11
Flash & seal roof & walls to protect from wind-driven rain	7	7	7	9	6

Table B33. Practices Would Consider, BUT NOT DONE CURRENTLY: States at risk of Earthquakes & Wildfires

	Total US	BUILD IN STATES AT RISK OF:			
		EARTHQUAKES		WILDFIRES	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(91)	(311)	(84)	(318)
Construction Practices	%	%	%	%	%
Reinforce double entry doors to protect from high winds	33	38	32	37	32
Use impact-resistant doors to protect from flying debris	32	37	31	42	30
Use high-wind-resistant/hail damage-resistant roofing	32	35	31	38	31
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	31	30	31	31	31
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	29	31	28	37	26
Reinforce garage doors to protect from high winds	28	36	26	40	25
Use landscaping features in states at risk of wildfires	27	22	28	33	25
Anchor appliances to wall to minimize earthquake damage	25	31	23	43	20
Protect windows & sliding patio doors from flying debris with hurricane shutters	25	24	25	32	23
Use Class A, B or C roofing or fire-retardant treated roofing	25	26	25	25	25
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	25	25	24	25	25
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	23	19	24	23	23
Crawlspace foundations/concrete piers vs fill to raise home	23	20	23	26	22
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	22	23	22	31	20
Elevate & secure water heaters to protect from earthquake/flood/high winds	21	22	21	17	22
Improve window & door flashing/sealing with pan flashing	20	20	20	24	19
Brace gable end walls/roof projections to protect from earthquakes/high winds	19	21	19	21	19
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	13	11	14	18	12
Build above BFE by more than one foot	11	13	10	15	10
Flash & seal roof & walls to protect from wind-driven rain	7	5	7	11	6

Table B34. Practices Would Consider, BUT NOT DONE CURRENTLY: States at risk of Hurricanes & Floods

	Total US	BUILD IN STATES AT RISK OF:			
		HURRICANES		FLOODS	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(189)	(213)	(196)	(206)
Construction Practices	%	%	%	%	%
Reinforce double entry doors to protect from high winds	33	32	34	32	34
Use impact-resistant doors to protect from flying debris	32	30	34	28	36
Use high-wind-resistant/hail damage-resistant roofing	32	31	33	29	35
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	31	30	31	29	33
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	29	29	29	26	32
Reinforce garage doors to protect from high winds	28	29	28	26	31
Use landscaping features in states at risk of wildfires	27	28	25	26	28
Anchor appliances to wall to minimize earthquake damage	25	23	27	23	27
Protect windows & sliding patio doors from flying debris with hurricane shutters	25	25	25	21	29
Use Class A, B or C roofing or fire-retardant treated roofing	25	24	26	20	30
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	25	26	23	23	26
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	23	19	26	18	27
Crawlspace foundations/concrete piers vs fill to raise home	23	27	19	22	23
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	22	23	21	20	24
Elevate & secure water heaters to protect from earthquake/flood/high winds	21	23	20	20	22
Improve window & door flashing/sealing with pan flashing	20	21	20	20	20
Brace gable end walls/roof projections to protect from earthquakes/high winds	19	20	19	17	21
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	13	13	13	12	14
Build above BFE by more than one foot	11	10	12	9	13
Flash & seal roof & walls to protect from wind-driven rain	7	7	7	8	6

Table B35. Practices Would Consider, BUT NOT DONE CURRENTLY: States at risk of Snowstorms

	Total US	BUILD IN STATES AT RISK OF:	
		SNOWSTORMS	
		YES	NO
Base: Total Respondents	(402)	(126)	(276)
Construction Practices	%	%	%
Reinforce double entry doors to protect from high winds	33	33	33
Use impact-resistant doors to protect from flying debris	32	32	32
Use high-wind-resistant/hail damage-resistant roofing	32	30	33
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	31	31	30
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	29	25	30
Reinforce garage doors to protect from high winds	28	28	29
Use landscaping features in states at risk of wildfires	27	26	27
Anchor appliances to wall to minimize earthquake damage	25	30	23
Protect windows & sliding patio doors from flying debris with hurricane shutters	25	28	24
Use Class A, B or C roofing or fire-retardant treated roofing	25	25	25
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	25	25	24
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	23	23	22
Crawlspace foundations/concrete piers vs fill to raise home	23	25	22
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	22	22	22
Elevate & secure water heaters to protect from earthquake/flood/high winds	21	20	22
Improve window & door flashing/sealing with pan flashing	20	18	21
Brace gable end walls/roof projections to protect from earthquakes/high winds	19	22	18
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	13	12	13
Build above BFE by more than one foot	11	17	8
Flash & seal roof & walls to protect from wind-driven rain	7	8	6

Table B36. Practices Unlikely to Do, and NOT DONE CURRENTLY: Region

	US CENSUS REGION				
	Total US	Northeast	South	Midwest	West
Base: Total Respondents	(402)	(67)	(163)	(119)	(53)
Construction Practices	%	%	%	%	%
Protect windows & sliding patio doors from flying debris with hurricane shutters	56	45	52	69	57
Anchor appliances to wall to minimize earthquake damage	54	51	63	60	19
Use landscaping features in states at risk of wildfires	44	45	50	51	11
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	40	37	50	39	13
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	40	49	42	45	11
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	40	40	46	39	19
Elevate & secure water heaters to protect from earthquake/flood/high winds	35	28	33	46	21
Use impact-resistant doors to protect from flying debris	35	33	33	39	30
Reinforce double entry doors to protect from high winds	33	37	33	34	23
Crawlspace foundations/concrete piers vs fill to raise home	32	24	31	39	32
Reinforce garage doors to protect from high winds	32	39	28	30	36
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	29	25	27	38	23
Use high-wind-resistant/hail damage-resistant roofing	25	25	26	20	28
Use Class A, B or C roofing or fire-retardant treated roofing	23	30	29	20	4
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	23	27	21	23	23
Brace gable end walls/roof projections to protect from earthquakes/high winds	17	22	18	17	9
Build above BFE by more than one foot	13	16	10	14	15
Improve window & door flashing/sealing with pan flashing	11	10	14	8	9
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	11	10	10	10	17
Flash & seal roof & walls to protect from wind-driven rain	5	7	6	3	6

Table B37. Practices Unlikely to Do, and NOT DONE CURRENTLY: States at risk of Tornadoes & Hail

	Total US	BUILD IN STATES AT RISK OF:			
		TORNADOES		HAIL	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(180)	(222)	(82)	(320)
Construction Practices	%	%	%	%	%
Protect windows & sliding patio doors from flying debris with hurricane shutters	56	64	50	59	56
Anchor appliances to wall to minimize earthquake damage	54	59	50	51	55
Use landscaping features in states at risk of wildfires	44	49	40	40	45
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	40	41	39	39	40
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	40	41	40	32	42
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	40	38	41	37	40
Elevate & secure water heaters to protect from earthquake/flood/high winds	35	38	32	37	34
Use impact-resistant doors to protect from flying debris	35	36	33	33	35
Reinforce double entry doors to protect from high winds	33	35	31	33	32
Crawlspace foundations/concrete piers vs fill to raise home	32	37	28	40	30
Reinforce garage doors to protect from high winds	32	30	33	21	34
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	29	33	26	32	29
Use high-wind-resistant/hail damage-resistant roofing	25	21	27	20	26
Use Class A, B or C roofing or fire-retardant treated roofing	23	22	25	18	25
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	23	22	23	12	25
Brace gable end walls/roof projections to protect from earthquakes/high winds	17	17	18	17	17
Build above BFE by more than one foot	13	14	12	15	13
Improve window & door flashing/sealing with pan flashing	11	11	11	13	10
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	11	12	10	18	9
Flash & seal roof & walls to protect from wind-driven rain	5	4	7	5	6

Table B38. Practices Unlikely to Do, and NOT DONE CURRENTLY: States at risk of Earthquakes & Wildfires

	Total US	BUILD IN STATES AT RISK OF:			
		EARTHQUAKES		WILDFIRES	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(91)	(311)	(84)	(318)
Construction Practices	%	%	%	%	%
Protect windows & sliding patio doors from flying debris with hurricane shutters	56	62	55	55	57
Anchor appliances to wall to minimize earthquake damage	54	40	58	31	60
Use landscaping features in states at risk of wildfires	44	36	47	20	51
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	40	25	44	21	45
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	40	31	43	15	47
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	40	31	42	26	43
Elevate & secure water heaters to protect from earthquake/flood/high winds	35	23	38	21	38
Use impact-resistant doors to protect from flying debris	35	33	35	30	36
Reinforce double entry doors to protect from high winds	33	27	34	26	34
Crawlspace foundations/concrete piers vs fill to raise home	32	30	33	35	32
Reinforce garage doors to protect from high winds	32	31	32	31	32
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	29	24	31	25	31
Use high-wind-resistant/hail damage-resistant roofing	25	25	24	26	24
Use Class A, B or C roofing or fire-retardant treated roofing	23	16	25	10	27
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	23	24	22	18	24
Brace gable end walls/roof projections to protect from earthquakes/high winds	17	11	19	13	18
Build above BFE by more than one foot	13	14	13	14	13
Improve window & door flashing/sealing with pan flashing	11	5	13	14	10
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	11	12	11	19	9
Flash & seal roof & walls to protect from wind-driven rain	5	3	6	6	5

Table B39. Practices Unlikely to Do, and NOT DONE CURRENTLY: States at risk of Hurricanes & Floods

	Total US	BUILD IN STATES AT RISK OF:			
		HURRICANES		FLOODS	
		YES	NO	YES	NO
Base: Total Respondents	(402)	(189)	(213)	(196)	(206)
Construction Practices	%	%	%	%	%
Protect windows & sliding patio doors from flying debris with hurricane shutters	56	50	62	52	61
Anchor appliances to wall to minimize earthquake damage	54	61	47	56	52
Use landscaping features in states at risk of wildfires	44	49	40	44	44
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	40	51	31	42	38
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	40	45	36	39	41
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	40	48	32	40	39
Elevate & secure water heaters to protect from earthquake/flood/high winds	35	35	34	30	39
Use impact-resistant doors to protect from flying debris	35	34	35	31	38
Reinforce double entry doors to protect from high winds	33	35	31	30	35
Crawlspace foundations/concrete piers vs fill to raise home	32	28	36	28	36
Reinforce garage doors to protect from high winds	32	31	32	29	34
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	29	28	31	25	33
Use high-wind-resistant/hail damage-resistant roofing	25	28	22	27	23
Use Class A, B or C roofing or fire-retardant treated roofing	23	31	16	28	19
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	23	24	22	19	26
Brace gable end walls/roof projections to protect from earthquakes/high winds	17	22	13	18	16
Build above BFE by more than one foot	13	12	15	13	14
Improve window & door flashing/sealing with pan flashing	11	16	7	11	11
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	11	12	10	13	9
Flash & seal roof & walls to protect from wind-driven rain	5	8	3	6	5

Table B40. Practices Unlikely to Do, and NOT DONE CURRENTLY: States at risk of Snowstorms

	Total US	BUILD IN STATES AT RISK OF:	
		SNOWSTORMS	
		YES	NO
Base: Total Respondents	(402)	(126)	(276)
Construction Practices	%	%	%
Protect windows & sliding patio doors from flying debris with hurricane shutters	56	58	56
Anchor appliances to wall to minimize earthquake damage	54	48	57
Use landscaping features in states at risk of wildfires	44	42	45
Brace/anchor hillside homes to prevent sliding during heavy rain/earthquake	40	34	43
Use ignition-resistant building materials and/or fire-resistance construction in states at risk of wildfires	40	40	40
Use solid core wood or fire-resistance windows or doors in states at risk of wildfires	40	38	40
Elevate & secure water heaters to protect from earthquake/flood/high winds	35	37	34
Use impact-resistant doors to protect from flying debris	35	43	31
Reinforce double entry doors to protect from high winds	33	38	30
Crawlspace foundations/concrete piers vs fill to raise home	32	37	30
Reinforce garage doors to protect from high winds	32	40	28
Elevate & secure outdoor HVAC equipment to protect from flood/high winds	29	35	27
Use high-wind-resistant/hail damage-resistant roofing	25	27	24
Use Class A, B or C roofing or fire-retardant treated roofing	23	21	24
Use high-wind-resistant siding, soffit & fascia products and/or tighter fastener & tie spacing	23	31	19
Brace gable end walls/roof projections to protect from earthquakes/high winds	17	21	16
Build above BFE by more than one foot	13	16	12
Improve window & door flashing/sealing with pan flashing	11	12	11
Hurricane straps at roof-to-wall, wall-to-wall, & wall-to-foundation connections to resist wind, floor & quake loads	11	13	10
Flash & seal roof & walls to protect from wind-driven rain	5	6	5

Table B41. Company Characteristics: Region

	US CENSUS REGION				
	Total US	Northeast	South	Midwest	West
Base: Total Respondents	(402)	(67)	(163)	(119)	(53)
DONE IN THE PAST 12 MONTHS:	%	%	%	%	%
Built new single-family homes	98	99	98	98	98
Built new multifamily buildings	14	15	8	18	21
Remodeled existing homes	59	64	52	68	57
Remodeled existing multifamily buildings	12	15	9	11	19
AVERAGE # OF HOMES BUILT PAST 12 MONTHS (P12M):					
SFD Move-up Homes	11.2	4.5	15.6	10.5	7.4
SFD Starter Homes	9.2	3.1	14.7	6.5	5.8
SFD Luxury Homes	6.5	1.9	8.0	7.1	5.9
Multifamily Apartments/Condos (Units)	13.9	4.0	2.2	29.6	26.9
Townhomes/Duplexes (Units)	4.4	2.2	5.3	3.0	7.1
AVERAGE # OF REMODELING PROJECTS P12M:					
SFD Homes	8.3	7.4	10.0	8.5	4.5
Townhomes/Duplexes	4.8	4.2	5.0	5.8	2.8
Multifamily Apartments/Condos	3.9	3.7	4.7	4.3	1.6
FOOTPRINT:					
Local	87	88	90	84	87
Regional	11	10	10	11	13
National	2	1	-	5	-
BUILD IN STATES AT RISK OF:					
Flooding	49	67	67	24	26
Hurricanes	47	76	85	-	-
Tornadoes	45	-	40	96	-
Snowstorms	31	66	-	39	68
Earthquakes	23	-	13	24	79
Wildfire	21	-	19	-	100
Hail	20	-	19	37	13

QUESTIONNAIRE

Q1

Are you or do you currently work for an active U.S. home builder?

- Yes (1)
- No (2)

Q2

Which of the following has your company's local operations done in the past 12 months?

- Built new homes (1)
- Built new multifamily buildings (2)
- Remodeled existing homes (3)
- Remodeled existing multifamily buildings (4)
- None of the above (5)

Q3

How many of the following did your local operations construct in the past 12 months?

(Enter number of units. If none, enter 0.)

- Single-Family Detached – Starter homes (1) _____
- Single-Family Detached – Move-up homes (2) _____
- Single-Family Detached – Luxury homes (3) _____
- Single-Family Attached – Townhouse or Duplexes (living units) (4) _____
- Multifamily – Apartments or Condos (living units) (5) _____

Q4

How many of the following did your local operations construct in the past 12 months?

(Enter number of units. If none, enter 0.)

- Single-Family Detached remodeling jobs (1) _____
- Single-Family Attached remodeling jobs (2) _____
- Multifamily remodeling jobs (3) _____

Q5

Which of the following best describes your company's local operations?

- My company serves only our local market area (1)
- My company serves multiple markets in this region of the country (2)
- My company serves multiple markets across the nation (3)

Q6

In which state did your company's local operations conduct the majority of its work during the past 12 months?

- Alabama (1)
- Alaska (2)
- Arizona (3)
- Arkansas (4)
- California (5)
- Colorado (6)
- Connecticut (7)
- Delaware (8)
- District of Columbia (9)
- Florida (10)
- Georgia (11)
- Hawaii (12)
- Idaho (13)
- Illinois (14)
- Indiana (15)
- Iowa (16)
- Kansas (17)
- Kentucky (18)
- Louisiana (19)
- Maine (20)
- Maryland (21)
- Massachusetts (22)
- Michigan (23)
- Minnesota (24)
- Mississippi (25)
- Missouri (26)
- Montana (27)
- Nebraska (28)
- Nevada (29)
- New Hampshire (30)
- New Jersey (31)
- New Mexico (32)
- New York (33)
- North Carolina (34)
- North Dakota (35)
- Ohio (36)
- Oklahoma (37)
- Oregon (38)
- Pennsylvania (39)
- Rhode Island (40)
- South Carolina (41)
- South Dakota (42)
- Tennessee (43)
- Texas (44)
- Utah (45)
- Vermont (46)
- Virginia (47)
- Washington (48)
- West Virginia (49)
- Wisconsin (50)
- Wyoming (51)

Q7

Which of the following “enhanced” disaster-resistant provisions do the state or local jurisdiction where you most commonly build REQUIRE as part of your statewide or locally-adopted building code?

(Select ALL that apply)

- IBHS Fortified criteria (1)
- NFPA Firewise Community criteria (2)
- Enhanced floodplain management requirements (i.e. NFIP Community Rating System) (3)
- State appendix for disaster-resistant construction (e.g. GA Disaster Resilient IRC Appendix) (4)
- Local ordinance for enhanced construction (e.g. Moore, OK minimum requirements for high wind resistance) (5)
- Local ordinance for seismic retrofit (e.g. soft-story, cripple walls, unreinforced brick) (6)
- Other (please specify) (7) _____
- None of these (8)

Q8

In which state or local jurisdiction (where you most commonly build) does an appendix for disaster-resistant construction, or local ordinance for enhanced construction or seismic retrofit apply?

Q9

Which of the following incentives have any of the completed projects your company worked on been eligible for, during the past 5 years?

(Select ALL that apply)

- FEMA mitigation grants (e.g. Pre-Disaster Mitigation Program; Hazard Mitigation Grant Program) (1)
- State-mandated insurance discounts (e.g. discounts in AL, GA, MS, and NC for building to IBHS FORTIFIED criteria) (2)
- State-mandated tax credits (e.g. tax deductions for retrofits in AL and LA) (3)
- State retrofit grant program (e.g. Strengthen Alabama Homes, South Carolina Safe Home, or CA’s Earthquake Brace+Bolt program) (4)
- Private retrofit grant program (5)
- Other incentive (please specify) (6) _____

Q10a

For each of the following construction practices, please select the phrase that best describes if it is something your company does because it is mandatory (required by code, ordinance or local jurisdiction), or if it is something your company does or doesn't do voluntarily. Please select one phrase for each construction practice.

	MANDATORY (1)	VOLUNTARY: Not required but we do it anyway (2)	VOLUNTARY: Don't do, but would consider doing in future (3)	VOLUNTARY: Don't do, and unlikely to do in the future (4)
Anchor freestanding appliances such as refrigerators, washing machines and dryers to the wall to minimize damage in earthquakes. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brace or anchor homes on steep sites (i.e. hillside homes) to prevent them from sliding during a heavy rain or earthquake (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brace gable end walls and/or roof projections such as dormers or skylights to prevent damage or failure due to earthquakes or high winds (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Build above the base flood elevation (BFE) by more than one foot. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Elevate and secure outdoor HVAC equipment (e.g. compressors) to protect from damage due to flood or high winds. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Elevate and secure water heaters to protect from damage due to earthquake, flood, or high winds. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flash AND seal all roof and wall penetrations (e.g. chimneys, vents, pipes) to protect against heavy or wind-driven rain. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve window and door flashing/sealing by using pan flashing (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protect windows and sliding patio doors with hurricane shutters to prevent damage from flying debris due to a hurricane, tornado or other severe wind event. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide hurricane straps or clips at roof-to-wall, wall-to-wall, and wall-to-foundation connections to provide a continuous path to resist wind, floor and earthquake loads. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Provide impact-resistant exterior doors to prevent damage from flying debris due to a hurricane, tornado or other severe wind event. (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reinforce double entry doors to prevent them from blowing open during high wind events. (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reinforce garage doors to prevent them from being blown in due to high winds such as hurricanes or tornadoes. (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use Class A, B or C roofing materials or fire-retardant treated shakes or shingles. (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use crawlspace foundations or concrete/masonry piers to elevate a home above surrounding grade or above base flood elevation, instead of using fill to raise the home. (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use high-wind-resistant (e.g. Class F or H asphalt shingles) or hail damage-resistant roofing materials. (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use high-wind-resistant siding, soffit and fascia products and/or tighter fastener and tie spacing (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use ignition-resistant building materials on the exterior of a house and/or fire-resistance-rated construction in states at risk of wildfires. (18)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use landscaping features that help protect against wildfires, such as keeping vegetation away from the house, trimmed, pruned, and watered or keeping trees more than 10 feet apart and more than 10 feet from the home. (19)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use solid core wood or fire-resistance-rated (20-minute minimum) windows or doors with fire-resistant glazing (e.g. tempered glass, glass block) in states at risk of wildfires. (20)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q10b

Are there any other “enhanced” disaster-resistant construction practices, your company does because it is mandatory (required by code, ordinance or local jurisdiction), or it is something your company does or doesn’t do voluntarily.

- Yes (1)
- No (2)

Q10c

Please indicate which of if the following statements best describes the other construction practice(s) your company performs:

- Mandatory (1)
- Voluntary: Not required but we do it anyway (2)
- Voluntary: Don’t do, but would consider doing in future (3)
- Voluntary: Don’t do, and unlikely to do in the future (4)

Q10d

In the space provided below, please describe the other construction practice(s) your company performs.



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