

**Form V-2: Mitigation Measures - Range of Changes in Damage**

**Modeling Organization:** AIR Worldwide  
**Model Name & Version Number:** AIR Hurricane Model for the U.S. v17.0.1 as implemented in Touchstone v8.2.5  
**Model Release Date:** 6/14/2019

INDIVIDUAL MITIGATION MEASURES			PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE) * 100																			
			FRAME BUILDING					MASONRY BUILDING														
			WINDSPEED (MPH)					WINDSPEED (MPH)														
			60	85	110	135	160	60	85	110	135	160										
REFERENCE BUILDING			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ROOF CONFIGURATION	BRACED GABLE ENDS		10.8	15.0	13.8	9.2	5.1	10.7	14.9	13.8	9.4	6.0										
	HIP ROOF		14.8	19.0	17.4	12.4	7.8	14.4	18.7	17.2	12.6	8.5										
ROOF COVERING	METAL		6.0	4.9	3.0	1.7	0.3	6.0	4.7	2.9	1.6	0.5										
	ASTM D7158 CLASS H SHINGLES (150 MPH)		10.5	7.7	4.4	2.3	0.6	10.3	7.4	4.2	2.2	1.0										
	MEMBRANE		9.8	14.3	11.4	2.2	0.6	9.8	14.5	11.3	2.1	1.0										
	NAILING OF DECK 8d		9.4	18.8	21.1	15.7	8.3	9.3	18.6	20.7	16.2	9.0										
ROOF-FLOOR WALL STRENGTH	CLIPS		1.6	5.8	11.0	10.9	6.1	1.8	5.5	10.6	11.0	6.8										
	STRAPS		2.1	7.3	13.4	13.4	8.2	2.3	6.9	13.3	13.8	8.9										
WALL-FLOOR STRENGTH	TIES OR CLIPS		0.0	0.4	0.6	2.8	6.3	0.0	0.4	0.6	2.7	7.1										
	STRAPS		0.0	0.8	2.2	6.1	12.1	0.0	0.8	2.1	6.2	12.6										
WALL-FOUNDATION STRENGTH	LARGER ANCHORS OR CLOSER SPACING		0.0	0.4	0.6	2.8	6.3	-	-	-	-	-										
	STRAPS		0.0	0.8	2.2	6.1	12.1	-	-	-	-	-										
	VERTICAL REINFORCING		-	-	-	-	-	0.1	1.1	2.2	7.0	15.4										
OPENING PROTECTION	WINDOW SHUTTERS	STRUCTURAL WOOD PANEL	8.5	13.2	12.4	9.1	7.0	8.2	12.9	11.8	9.1	7.7										
		METAL	8.5	13.2	12.4	9.1	7.0	8.2	12.9	11.8	9.1	7.7										
	DOOR AND SKYLIGHT COVERS		1.6	4.0	5.0	4.7	3.3	1.8	3.7	4.6	4.6	4.1										
WINDOW, DOOR, SKYLIGHT STRENGTH	WINDOWS	IMPACT RATED	12.1	19.2	18.9	15.3	12.6	11.7	18.5	18.2	15.5	13.0										
	ENTRY DOORS	MEETS WINDBORNE DEBRIS REQUIREMENTS	1.6	4.0	5.0	4.7	3.3	1.8	3.7	4.6	4.6	4.1										
	GARAGE DOORS	MEETS WINDBORNE DEBRIS REQUIREMENTS	2.4	4.2	3.4	2.1	0.8	2.8	4.4	3.6	2.1	1.4										
	SLIDING GLASS DOORS	MEETS WINDBORNE DEBRIS REQUIREMENTS	-0.2	-0.7	-0.8	-0.7	-0.3	-0.3	-0.6	-0.7	-0.7	-0.6										
	SKYLIGHT	IMPACT RATED	1.3	1.6	1.4	1.0	0.3	1.4	1.6	1.3	0.9	0.6										
MITIGATION MEASURES IN COMBINATION			PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE)*100																			
			FRAME BUILDING					MASONRY BUILDING														
			WINDSPEED (MPH)					WINDSPEED (MPH)														
			60	85	110	135	160	60	85	110	135	160										
BLINDING	MITIGATED BUILDING		34.0	49.6	52.3	41.1	25.3	32.7	47.4	50.3	40.6	25.6										

**Percentage Difference Between Touchstone 8.2.5 Form V-2 and Touchstone 6.1.0 Form V-2**

Change in values:	No	No	No	No	No	No	No	No	No	No	No
MAX	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
MIN	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

INDIVIDUAL MITIGATION MEASURES			PERCENTAGE CHANGES IN DAMAGE FROM TOUCHSTONE 6.1.0 TO TOUCHSTONE 8.2.5 ((REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE) * 100																			
			FRAME BUILDING					MASONRY BUILDING														
			WINDSPEED (MPH)					WINDSPEED (MPH)														
			60	85	110	135	160	60	85	110	135	160										
REFERENCE BUILDING			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ROOF CONFIGURATION	BRACED GABLE ENDS		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	HIP ROOF		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
ROOF COVERING	METAL		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	ASTM D7158 CLASS H SHINGLES (150 MPH)		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	MEMBRANE		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	NAILING OF DECK 8d		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
ROOF-FLOOR WALL STRENGTH	CLIPS		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	STRAPS		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
WALL-FLOOR STRENGTH	TIES OR CLIPS		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	STRAPS		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
WALL-FOUNDATION STRENGTH	LARGER ANCHORS OR CLOSER SPACING		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	STRAPS		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	VERTICAL REINFORCING		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
OPENING PROTECTION	WINDOW SHUTTERS	STRUCTURAL WOOD PANEL	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
		METAL	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	DOOR AND SKYLIGHT COVERS		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
WINDOW, DOOR, SKYLIGHT STRENGTH	WINDOWS	IMPACT RATED	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	ENTRY DOORS	MEETS WINDBORNE DEBRIS REQUIREMENTS	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	GARAGE DOORS	MEETS WINDBORNE DEBRIS REQUIREMENTS	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	SLIDING GLASS DOORS	MEETS WINDBORNE DEBRIS REQUIREMENTS	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
	SKYLIGHT	IMPACT RATED	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										
MITIGATION MEASURES IN COMBINATION			PERCENTAGE CHANGES IN DAMAGE FROM TOUCHSTONE 6.1.0 TO TOUCHSTONE 8.2.5 ((REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE) * 100																			
			FRAME BUILDING					MASONRY BUILDING														
			WINDSPEED (MPH)					WINDSPEED (MPH)														
			60	85	110	135	160	60	85	110	135	160										
BLINDING	MITIGATED BUILDING		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%										

## Form V-2: Mitigation Measures - Range of Changes in Damage

**Modeling Organization:** AIR Worldwide  
**Model Name & Version Number:** AIR Hurricane Model for the U.S. v17.0.0 as implemented in Touchstone v6.1.0  
**Model Release Date:** 9/4/2018

INDIVIDUAL MITIGATION MEASURES		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE) * 100									
		FRAME BUILDING					MASONRY BUILDING				
		WINDSPEED (MPH)					WINDSPEED (MPH)				
		60	85	110	135	160	60	85	110	135	160
REFERENCE BUILDING		-	-	-	-	-	-	-	-	-	-
ROOF CONFIGURATION	BRACED GABLE ENDS	10.8	15.0	13.8	9.2	5.1	10.7	14.9	13.8	9.4	6.0
	HIP ROOF	14.8	19.0	17.4	12.4	7.8	14.4	18.7	17.2	12.6	8.5
ROOF COVERING	METAL	6.0	4.9	3.0	1.7	0.3	6.0	4.7	2.9	1.6	0.5
	ASTM D7158 CLASS F SHINGLES (150 MPH)	10.5	7.7	4.4	2.3	0.6	10.3	7.4	4.2	2.2	1.0
	MEMBRANE	9.8	14.3	11.4	2.2	0.6	9.8	14.5	11.3	2.1	1.0
	NAILING OF DECK &d	9.4	18.8	21.1	15.7	8.3	9.3	18.6	20.7	16.2	9.0
ROOF-WALL STRENGTH	CLIPS	1.6	5.8	11.0	10.9	6.1	1.8	5.5	10.6	11.0	6.8
	STRAPS	2.1	7.3	13.4	13.4	8.2	2.3	6.9	13.3	13.8	8.9
WALL-FLOOR STRENGTH	TIES OR CLIPS	0.0	0.4	0.6	2.8	6.3	0.0	0.4	0.6	2.7	7.1
	STRAPS	0.0	0.8	2.2	6.1	12.1	0.0	0.8	2.1	6.2	12.6
WALL-FOUNDATION STRENGTH	LARGER ANCHORS OR CLOSER SPACING	0.0	0.4	0.6	2.8	6.3	-	-	-	-	-
	STRAPS	0.0	0.8	2.2	6.1	12.1	-	-	-	-	-
	VERTICAL REINFORCING	-	-	-	-	-	0.1	1.1	2.2	7.0	15.4
OPENING PROTECTION	WINDOW SHUTTERS	8.5	13.2	12.4	9.1	7.0	8.2	12.9	11.8	9.1	7.7
	STRUCTURAL WOOD PANEL	8.5	13.2	12.4	9.1	7.0	8.2	12.9	11.8	9.1	7.7
	METAL	8.5	13.2	12.4	9.1	7.0	8.2	12.9	11.8	9.1	7.7
	DOOR AND SKYLIGHT COVERS	1.6	4.0	5.0	4.7	3.3	1.8	3.7	4.6	4.6	4.1
WINDOW, DOOR, SKYLIGHT STRENGTH	WINDOWS	12.1	19.2	18.9	15.3	12.6	11.7	18.5	18.2	15.5	13.0
	ENTRY DOORS	1.6	4.0	5.0	4.7	3.3	1.8	3.7	4.6	4.6	4.1
	GARAGE DOORS	2.4	4.2	3.4	2.1	0.8	2.8	4.4	3.6	2.1	1.4
	SLIDING GLASS DOORS	-0.2	-0.7	-0.8	-0.7	-0.3	-0.3	-0.6	-0.7	-0.7	-0.6
	SKYLIGHT	1.3	1.6	1.4	1.0	0.3	1.4	1.6	1.3	0.9	0.6
MITIGATION MEASURES IN COMBINATION		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATE - MITIGATED DAMAGE RATE) / REFERENCE DAMAGE RATE)*100									
		FRAME BUILDING					MASONRY BUILDING				
		WINDSPEED (MPH)					WINDSPEED (MPH)				
		60	85	110	135	160	60	85	110	135	160
BUILDING	MITIGATED BUILDING	34.0	49.6	52.3	41.1	25.3	32.7	47.4	50.3	40.6	25.6