

Company: Risk Management Solutions, Inc.

Purpose:

This spreadsheet includes the Form V-2 range of changes in damage for mitigation measures (2017 ROA) produced from North Atlantic Hurricane Models 18.1 (Build 1945) using RiskLink 18.1 and those produced using North Atlantic Hurricane Models 18.1.1 (Build 1945) on RiskLink 18.1.1

Sheets: *There are 3 sheets.*

The first sheet (named **RMS17FormV2_RL18.1**) represents the range of changes in damage generated by North Atlantic Hurricane Models 18.1 (Build 1945) using RiskLink 18.1.

The second sheet (named **RMS17FormV2_RL18.1.1**) represents the range of changes in damage generated by North Atlantic Hurricane Models 18.1.1 (Build 1945) using RiskLink 18.1.1

The third sheet (named **FormV2_Delta**) represents the absolute change between the two results, calculated as $([XXXX_RL18.1.1] - [XXXX_RL18.1])$

Summary of Form Changes – North Atlantic Hurricane Models 18.1.1 (Build 1945) on RiskLink 18.1.1 – North Atlantic Hurricane Models 18.1 (Build 1945) on RiskLink 18.1

	Min Diff	Max Diff
Individual Mitigation Measures & Secondary Characteristics	0.000%	0.000%
Mitigated Building	0.000%	0.000%

Form V-2: Hurricane Mitigation Measures and Secondary Characteristics, Range of Changes in Damage

Modeling Organization: RMS
Model Name & Version Number: North Atlantic Hurricane Models 18.1 (Build 1945) on RiskLink 18.1
Model Release Date: April, 2019

INDIVIDUAL HURRICANE MITIGATION MEASURES AND SECONDARY CHARACTERISTICS		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATIO - MITIGATED DAMAGE RATIO) / REFERENCE DAMAGE RATIO) * 100										
		FRAME BUILDING					MASONRY BUILDING					
		WINDSPEED (MPH)*					WINDSPEED (MPH)*					
		60	85	110	135	160	60	85	110	135	160	
	Reference Building											
Roof Strength	Braced Gable	1.8%	0.0%	0.9%	0.0%	0.0%	1.8%	0.0%	0.9%	0.0%	0.0%	
	Hip	30.9%	39.4%	36.9%	16.2%	0.0%	30.9%	39.4%	36.9%	16.2%	0.0%	
Roof Covering	Metal	21.2%	13.1%	10.9%	0.0%	0.0%	21.2%	13.1%	10.9%	0.0%	0.0%	
	ASTM D7158 Class H Shingles	48.4%	27.9%	6.9%	0.0%	0.0%	48.4%	27.9%	6.9%	0.0%	0.0%	
	Membrane	17.3%	6.0%	4.0%	0.0%	0.0%	17.3%	6.0%	4.0%	0.0%	0.0%	
	Nailing of Deck 8d Nails	22.5%	53.9%	44.4%	17.0%	4.8%	22.5%	53.9%	44.4%	17.0%	7.5%	
Roof-Wall Strength	Clips	13.0%	21.0%	23.3%	20.0%	14.2%	13.0%	21.0%	23.3%	20.0%	16.7%	
	Straps	17.4%	43.4%	43.3%	29.6%	14.2%	17.4%	43.4%	43.3%	29.6%	16.7%	
Wall-Floor Strength	Ties or Clips	0.0%	0.0%	15.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Straps	0.0%	0.0%	15.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Wall-Foundation Strength	Larger Anchor or Closer Spacing	0.0%	0.0%	15.0%	15.0%	0.0%						
	Straps	0.0%	0.0%	15.0%	15.0%	0.0%						
	Vertical Reinforcing						0.0%	0.0%	0.0%	0.0%	0.0%	
Opening Protection	Window Shutters	Structural Wood Panel	2.0%	9.6%	25.9%	15.1%	0.0%	2.0%	9.6%	25.9%	15.1%	0.0%
		Metal	5.9%	20.5%	39.8%	19.8%	0.0%	5.9%	20.5%	39.8%	19.8%	0.0%
	Door and Skylight Cover	21.6%	35.4%	44.4%	24.5%	0.0%	21.6%	35.4%	44.4%	24.5%	0.0%	
Window, Door, Skylight Strength	Windows	Impact Rated	11.8%	28.5%	44.4%	24.5%	0.0%	11.8%	28.5%	44.4%	24.5%	0.0%
	Entry Doors	Meets Windborne Debris Requirements	2.0%	6.6%	16.7%	8.5%	0.0%	2.0%	6.6%	16.7%	8.5%	0.0%
	Garage Doors		2.0%	6.6%	16.7%	8.5%	0.0%	2.0%	6.6%	16.7%	8.5%	0.0%
	Sliding Glass Doors		2.0%	4.7%	21.3%	10.4%	0.0%	2.0%	4.7%	21.3%	10.4%	0.0%
	Skylight		Impact Rated	2.0%	4.7%	21.3%	10.4%	0.0%	2.0%	4.7%	21.3%	10.4%
HURRICANE MITIGATION MEASURES AND SECONDARY CHARACTERISTICS IN COMBINATION		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATIO - MITIGATED DAMAGE RATIO) / REFERENCE DAMAGE RATIO) * 100										
		FRAME BUILDING					MASONRY BUILDING					
		WINDSPEED (MPH)*					WINDSPEED (MPH)*					
		60	85	110	135	160	60	85	110	135	160	
Building	Mitigated Building	67.6%	85.5%	78.3%	50.4%	20.7%	67.6%	85.5%	78.3%	50.4%	23.0%	

*Windspeeds are one-minute sustained 10-meter.

Form V-2: Hurricane Mitigation Measures and Secondary Characteristics, Range of Changes in Damage

Modeling Organization: RMS
Model Name & Version Number: North Atlantic Hurricane Models 18.1.1 (Build 1945) on RiskLink 18.1.1
Model Release Date: October, 2019

INDIVIDUAL HURRICANE MITIGATION MEASURES AND SECONDARY CHARACTERISTICS		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATIO - MITIGATED DAMAGE RATIO) / REFERENCE DAMAGE RATIO) * 100										
		FRAME BUILDING					MASONRY BUILDING					
		WINDSPEED (MPH)*					WINDSPEED (MPH)*					
		60	85	110	135	160	60	85	110	135	160	
	Reference Building											
Roof Strength	Braced Gable	1.8%	0.0%	0.9%	0.0%	0.0%	1.8%	0.0%	0.9%	0.0%	0.0%	
	Hip	30.9%	39.4%	36.9%	16.2%	0.0%	30.9%	39.4%	36.9%	16.2%	0.0%	
Roof Covering	Metal	21.2%	13.1%	10.9%	0.0%	0.0%	21.2%	13.1%	10.9%	0.0%	0.0%	
	ASTM D7158 Class H Shingles	48.4%	27.9%	6.9%	0.0%	0.0%	48.4%	27.9%	6.9%	0.0%	0.0%	
	Membrane	17.3%	6.0%	4.0%	0.0%	0.0%	17.3%	6.0%	4.0%	0.0%	0.0%	
	Nailing of Deck 8d Nails	22.5%	53.9%	44.4%	17.0%	4.8%	22.5%	53.9%	44.4%	17.0%	7.5%	
Roof-Wall Strength	Clips	13.0%	21.0%	23.3%	20.0%	14.2%	13.0%	21.0%	23.3%	20.0%	16.7%	
	Straps	17.4%	43.4%	43.3%	29.6%	14.2%	17.4%	43.4%	43.3%	29.6%	16.7%	
Wall-Floor Strength	Ties or Clips	0.0%	0.0%	15.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Straps	0.0%	0.0%	15.0%	15.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Wall-Foundation Strength	Larger Anchor or Closer Spacing	0.0%	0.0%	15.0%	15.0%	0.0%						
	Straps	0.0%	0.0%	15.0%	15.0%	0.0%						
	Vertical Reinforcing						0.0%	0.0%	0.0%	0.0%	0.0%	
Opening Protection	Window Shutters	Structural Wood Panel	2.0%	9.6%	25.9%	15.1%	0.0%	2.0%	9.6%	25.9%	15.1%	0.0%
		Metal	5.9%	20.5%	39.8%	19.8%	0.0%	5.9%	20.5%	39.8%	19.8%	0.0%
	Door and Skylight Cover	21.6%	35.4%	44.4%	24.5%	0.0%	21.6%	35.4%	44.4%	24.5%	0.0%	
Window, Door, Skylight Strength	Windows	Impact Rated	11.8%	28.5%	44.4%	24.5%	0.0%	11.8%	28.5%	44.4%	24.5%	0.0%
	Entry Doors	Meets Windborne Debris Requirements	2.0%	6.6%	16.7%	8.5%	0.0%	2.0%	6.6%	16.7%	8.5%	0.0%
			2.0%	6.6%	16.7%	8.5%	0.0%	2.0%	6.6%	16.7%	8.5%	0.0%
	Sliding Glass Doors	2.0%	4.7%	21.3%	10.4%	0.0%	2.0%	4.7%	21.3%	10.4%	0.0%	
	Skylight	Impact Rated	2.0%	4.7%	21.3%	10.4%	0.0%	2.0%	4.7%	21.3%	10.4%	0.0%
HURRICANE MITIGATION MEASURES AND SECONDARY CHARACTERISTICS IN COMBINATION		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATIO - MITIGATED DAMAGE RATIO) / REFERENCE DAMAGE RATIO) * 100										
		FRAME BUILDING					MASONRY BUILDING					
		WINDSPEED (MPH)*					WINDSPEED (MPH)*					
		60	85	110	135	160	60	85	110	135	160	
Building	Mitigated Building	67.6%	85.5%	78.3%	50.4%	20.7%	67.6%	85.5%	78.3%	50.4%	23.0%	

*Windspeeds are one-minute sustained 10-meter.

Absolute Difference in Hurricane Mitigation Measures and Secondary Characteristics, Range of Changes in Damage

Modeling Organization: RMS
Model Name & Version Number:
Model Release Date:

INDIVIDUAL HURRICANE MITIGATION MEASURES AND SECONDARY CHARACTERISTICS		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATIO - MITIGATED DAMAGE RATIO) / REFERENCE DAMAGE RATIO) * 100										
		FRAME BUILDING					MASONRY BUILDING					
		WINDSPEED (MPH)*					WINDSPEED (MPH)*					
		60	85	110	135	160	60	85	110	135	160	
	Reference Building											
Roof Strength	Braced Gable	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Hip	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Roof Covering	Metal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	ASTM D7158 Class H Shingles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Membrane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Nailing of Deck 8d Nails	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Roof-Wall Strength	Clips	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Straps	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Wall-Floor Strength	Ties or Clips	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Straps	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Wall-Foundation Strength	Larger Anchor or Closer Spacing	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	-	
	Straps	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	-	
	Vertical Reinforcing	-	-	-	-	-	0.0%	0.0%	0.0%	0.0%	0.0%	
Opening Protection	Window Shutters	Structural Wood Panel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Metal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Door and Skylight Cover	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Window, Door, Skylight Strength	Windows	Impact Rated	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Entry Doors	Meets Windborne Debris Requirements	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Garage Doors		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Sliding Glass Doors		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Skylight	Impact Rated	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
HURRICANE MITIGATION MEASURES AND SECONDARY CHARACTERISTICS IN COMBINATION		PERCENTAGE CHANGES IN DAMAGE ((REFERENCE DAMAGE RATIO - MITIGATED DAMAGE RATIO) / REFERENCE DAMAGE RATIO) * 100										
		FRAME BUILDING					MASONRY BUILDING					
		WINDSPEED (MPH)*					WINDSPEED (MPH)*					
		60	85	110	135	160	60	85	110	135	160	
Building	Mitigated Building	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

*Windspeeds are one-minute sustained 10-meter.