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Client: VHR Roof Tile Mfg.
 1665 Bohm Drive
 Little Chute, Wisconsin 54140
 Att. Bruce Rouleau

Report Date: 8/3/18
 ATLSF Report #: RT0803.02-18

Re: Calculations for Restoring Moment Due to Gravity and Aerodynamic Multiplier

References: Florida Building Code, 6th Edition (2017), section 1518.8.5; TAS 101-95, sections 10.1 & 10.2; TAS 102/102A, sections 9.1 & 9.2.

Test Authorized by:	Bruce Rouleau
Sampled by:	Client
Date of Receipt:	8/1/18
ATLSF Item #:	112462
Referenced Test Method:	Florida Building Code, TAS 101-95
Manufacturer:	VHR Roof Tile Mfg.
Model:	Spanish, High Profile, Concrete Roof Tile
Quantity Received:	6 tiles
Nominal Dimensions (in.): (l x w x h):	Specified by Supplier: 17.25 x 13.0 x 2.5 Measured: 17.1 x 13.0 x 2.6
Nominal Weight (lbf): specified by supplier:	11.6
Imprint:	LA CASA – on the underside, along the valley on the overlock side of the tile
Classification:	FBC TAS 112-95: Type 1a- High Profile, Interlocking, Class III ASTM C1492-03: Type I- High Profile, Interlocking, Normal Weight

Roof Tile: Spanish, High Profile, Concrete Roof Tile

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Calculations:

1. Weight (W): (Weight obtained from ATLSF Report #: RT0618.02-18)

$$W = m \times 1 \text{ lbf s}^2/\text{ft} \times 32.2 \text{ ft/s}^2$$

$$32.174 \text{ lbf}$$

$$W = 11.6 \times 1.0008$$

$$W = 11.609 \text{ lbf}$$

2. Restoring Moment Due to Gravity (
- M_g
-): (
- α
- : determined from mock-up layout in laboratory)

Direct Deck Application

$$M_g = W \times \cos(\theta - \alpha) \times L_g$$

$$M_g = 11.609 \cos(9.462^\circ - 4.746) \times 0.719$$

$$M_g = 8.319 \text{ ft-lbf}$$

Pitch	Equation	Restoring Moment Due to Gravity (M_g)
2:12	$M_g = 11.609 \times \cos(9.462 - 4.746) \times 0.719$	$M_g = 8.32$
3:12	$M_g = 11.609 \times \cos(14.036 - 4.746) \times 0.719$	$M_g = 8.24$
4:12	$M_g = 11.609 \times \cos(18.435 - 4.746) \times 0.719$	$M_g = 8.11$
5:12	$M_g = 11.609 \times \cos(22.620 - 4.746) \times 0.719$	$M_g = 7.94$
6:12	$M_g = 11.609 \times \cos(26.565 - 4.746) \times 0.719$	$M_g = 7.75$
7:12	$M_g = 11.609 \times \cos(30.256 - 4.746) \times 0.719$	$M_g = 7.53$

Batten Application

$$M_g = W \times \cos(\theta - \alpha) \times L_g$$

$$M_g = 11.609 \cos(9.462^\circ - 4.746) \times 0.531$$

$$M_g = 6.144 \text{ ft-lbf}$$

Pitch	Equation	Restoring Moment Due to Gravity (M_g)
2:12	$M_g = 11.609 \times \cos(9.462 - 4.746) \times 0.531$	$M_g = 6.14$
3:12	$M_g = 11.609 \times \cos(14.036 - 4.746) \times 0.531$	$M_g = 6.08$
4:12	$M_g = 11.609 \times \cos(18.435 - 4.746) \times 0.531$	$M_g = 5.99$
5:12	$M_g = 11.609 \times \cos(22.620 - 4.746) \times 0.531$	$M_g = 5.87$
6:12	$M_g = 11.609 \times \cos(26.565 - 4.746) \times 0.531$	$M_g = 5.72$
7:12	$M_g = 11.609 \times \cos(30.256 - 4.746) \times 0.531$	$M_g = 5.56$

3. Aerodynamic Multiplier (
- λ
-): For Direct Deck Application:

$$b = 12.0"/12: \quad l = 17.25"/12$$

$$\lambda = 0.156 \times b \times l^2: \quad \lambda = 0.156 \times 1.0 \times 1.438^2$$

$$\lambda = .32$$

4. Aerodynamic Multiplier (
- λ
-): For Batten Application:

$$b = 12.0"/12: \quad l = 17.25"/12$$

$$\lambda = 0.144 \times b \times l^2: \quad \lambda = 0.144 \times 1.0 \times 1.438^2$$

$$\lambda = .30$$

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The above calculations were conducted in compliance with Florida Building Code sections referenced above with the values based on our laboratory measurements. Static uplift testing was not performed. It is our understanding that the client is a member of the Tile Roof Institute and that Uplift Resistance Values will be obtained from their file data.

Disclaimer: This test report was prepared by American Test Lab of South Florida, (ATLSF), for the exclusive use of the above named client and does not constitute certification of this product. The results relate to the particular specimens tested and does not imply that the quality of similar or identical products manufactured or installed from specifications or shop drawings identical to the product tested. ATLSF is an independent testing laboratory and assumes that all information provided by the client is accurate and does not guarantee or warrant any product tested or installed. American Test Lab of South Florida, its employees, and witnessing engineers do not own, operate, or are controlled by any manufacturer and have no financial interest in the manufacture, manufacture of any related parts, specification, or installation of this or a competing product.

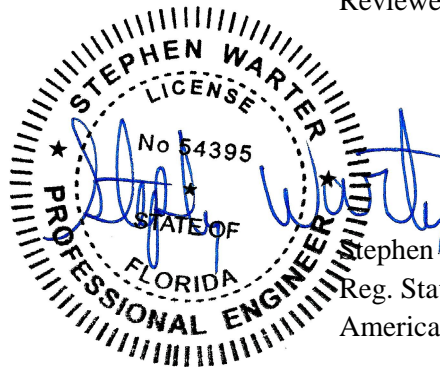
End of report.

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