

ELEVATION CERTIFICATE

IMPORTANT: Follow the instructions on pages 1-9.

OMB No. 1660-0008
 Expiration Date: July 31, 2015

SECTION A - PROPERTY INFORMATION

A1. Building Owner's Name JOSEPH COWARD		FOR INSURANCE COMPANY USE	
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 143 SHORE BOULEVARD		Company NAIC Number	
City KEANSBURG	State NEW JERSEY	ZIP Code 07734	
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) LOT NO. 7 IN BLOCK 33 ON OFFICIAL TAX MAP OF THE BOROUGH OF KEANSBURG			
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) RESIDENTIAL ELEVATED IN 2015			
A5. Latitude/Longitude: Lat. 40° 26' 53.7" N Long. 74° 07' 19.3" W Horizontal Datum: <input type="checkbox"/> NAD 1927 <input checked="" type="checkbox"/> NAD 1983			
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.			
A7. Building Diagram Number 7 walkout level enclosure NO ATTACHED GARAGE			
A8. For a building with a crawlspace or enclosure(s):		A9. For a building with an attached garage:	
a) Square footage of crawlspace or enclosure(s) 1,250 sq ft	a) Square footage of attached garage _____ sq ft		
b) No. of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade 6 COOKE TYPE	b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____		
c) Total net area of flood openings in A8.b 1338 sq in	c) Total net area of flood openings in A9.b _____ sq in		
d) Engineered flood openings? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No COOKE MODEL NO. 1 = 223 SQIN. COV.	d) Engineered flood openings? <input type="checkbox"/> Yes <input type="checkbox"/> No		

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. FIP Community Name & Community Number BOROUGH OF KEANSBURG 340303		B2. County Name MONMOUTH COUNTY		B3. State NEW JERSEY	
B4. Map/Panel Number 34 025 C 0034F	B5. Suffix F	B6. FIRM Index Date 01/11/2008	B7. FIRM Panel Effective/Revised Date 09/25/2009	B8. Flood Zone(s) AE	B9. Base Flood Elevation(s) (Zone A0, use base flood depth) EL. II'
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9: <input type="checkbox"/> FIS Profile <input checked="" type="checkbox"/> FIRM <input type="checkbox"/> Community Determined <input type="checkbox"/> Other/Source: _____					
B11. Indicate elevation datum used for BFE in Item B9: <input type="checkbox"/> NGVD 1929 <input checked="" type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other/Source: _____					
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Designation Date: ____/____/____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA					

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: Construction Drawings* Building Under Construction* Finished Construction
 *A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations - Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.
 Benchmark Utilized: **USCG DISK RM-1 ON BRIDGE** Vertical Datum: **NGVD 29 VERTCON CONV. NAVD 1988**

Indicate elevation datum used for the elevations in Items a) through h) below. NGVD 1929 NAVD 1988 Other/Source: _____
 Datum used for building elevations must be the same as that used for the BFE.

Check the measurement used.

a) Top of bottom floor (Including basement, crawlspace, or enclosure floor)	8 6	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
b) Top of the next higher floor elevated finished floor	13 8	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
c) Bottom of the lowest horizontal structural member (V Zones only)	_____	<input type="checkbox"/> feet <input type="checkbox"/> meters
d) Attached garage (top of slab)	_____	<input type="checkbox"/> feet <input type="checkbox"/> meters
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	14 0 furnace and water heater	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
f) Lowest adjacent (finished) grade next to building (LAG)	7 0	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
g) Highest adjacent (finished) grade next to building (HAG)	8 3	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	7 1	<input checked="" type="checkbox"/> feet <input type="checkbox"/> meters

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

- Check here if comments are provided on back of form. Were latitude and longitude in Section A provided by a licensed land surveyor? Yes No
- Check here if attachments.

Certifier's Name THOMAS CRAIG FINNEGAN P.L.S.		License Number N.J. GS NO. 38601	
Title PROFESSIONAL LAND SURVEYOR		Company Name THOMAS FINNEGAN LAND SURVEYING	
Address 245 EAST END AVENUE		City BELFORD	State ZIP Code NEW JERSEY 07718
Signature 		Date 09/22/2015	Telephone 732-787-0318

PLACE
SEAL
HERE

See Instructions for Item A6.

IMPORTANT: In these spaces, copy the corresponding information from Section A.		FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 143 SHORE BOULEVARD		Policy Number
City KEANSBURG	State NEW JERSEY	ZIP Code 07734
		Company/NAIC Number

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. Identify all photographs with date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.



" FRONT VIEW"

09/08/2015

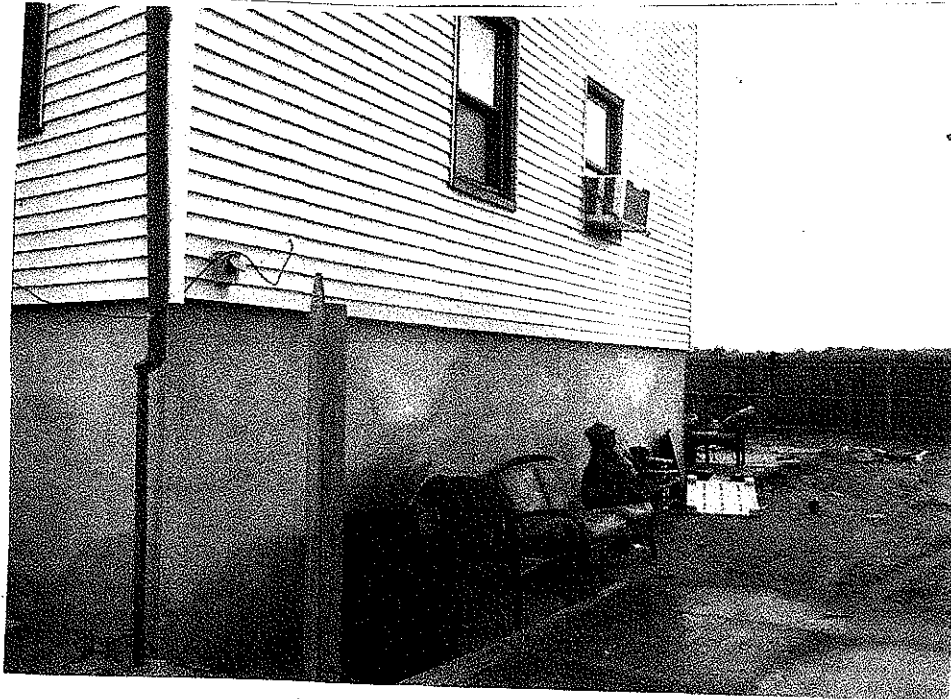


" REAR VIEW"

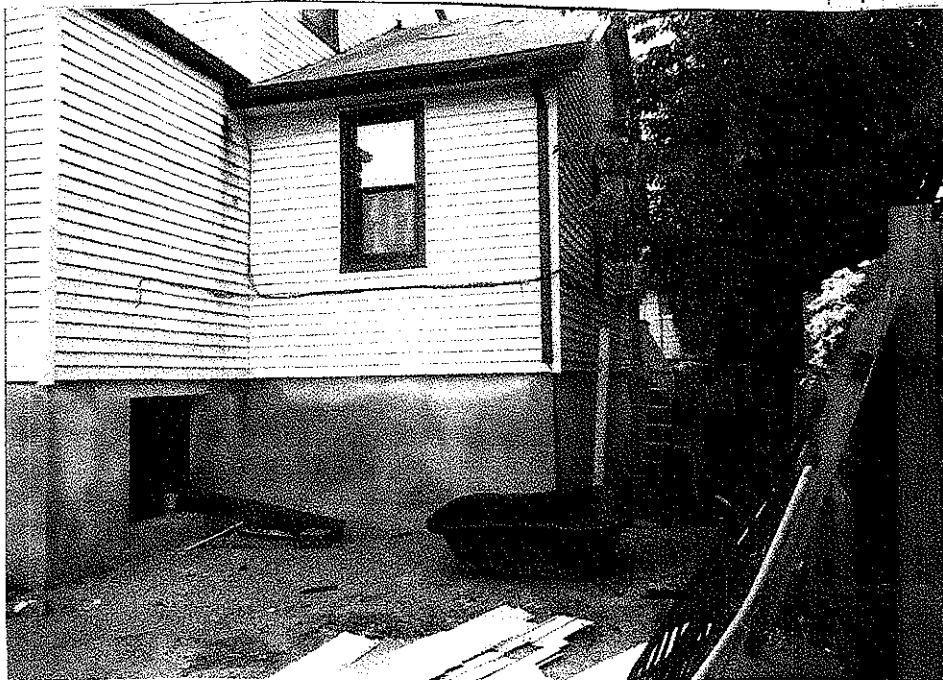
09/08/2015

IMPORTANT: In these spaces, copy the corresponding information from Section A.		DATE TAKEN
Building Street Address (Including Apt., Unit, Suite, and/or Bldg. No.) or R.O. Route and Box No. 143 SHORE BOULEVARD		PHOTOGRAPHER
City KEANSBURG	State NEW JERSEY	DATE TAKEN
	ZIP Code 07734	PHOTOGRAPHER

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8.



"RIGHT
SIDE
VIEW"
09/08/2015



"LEFT
SIDE
VIEW"
09/08/2015

Engineered Flood Openings Certificate

To satisfy requirements of the National Flood Insurance Program

This certification must be submitted to, and kept on file by, the local jurisdiction's permit authority. A copy should be retained by the owner to demonstrate compliance in order to receive flood insurance rating.

The Cooke Vent is certified as meeting the flood openings requirements for engineering openings as set forth in the Federal Emergency Management Agency's National Flood Insurance Program regulations (44CFR 60.3(c)(5)) and ASCE 24-98, provided it is installed according to the references, as summarized below. Flood openings are required in enclosures below elevated buildings, attached and detached garages, and accessory structures that meet the required limitations.

I do hereby certify that the Cooke Flood Vent is designed for installation in buildings, will allow for the automatic equalizing of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of flood water during floods up to and including the base(100-year) flood. One Cooke Vent for every 238 Sq.Ft. of enclosed area will provide sufficient hydrostatic pressure equalization during a flood provided the installation limitations and instructions are followed as listed below. To calculate the required number of Cooke Vents divide the Square Feet of enclosed area by 238.

*Required Fields

Signature: *A. Ancona* (Antonio Ancona, P.E.)

Title: Consulting Engineer

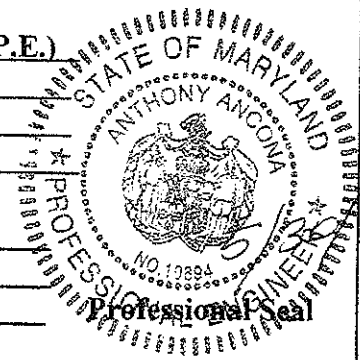
Type of License: Professional Engineer

License Number MD PE 10894

*Project Name _____

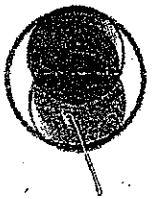
*Project Address _____

*Date Submitted _____



Installation Limitations and Instructions

1. The Cooke Vent unit provides sufficient automatic equalization of hydrostatic pressure on walls and foundations of buildings located in flood hazard areas where the rate of rise is expected to be less than or approximately 5 feet per hour.
2. Enclosed areas below otherwise elevated buildings, non-elevated attached and detached garages, and certain non-elevated accessory structures located in flood hazard areas are to be used solely for parking of vehicles, building access, or storage.
3. Each enclosed area shall have at least two flood openings, installed on different sides of the enclosed area.
4. The bottom of the flood openings shall be no more than one foot above the adjacent finished ground level.
5. Installation must be in accordance with manufacturer's instructions.
6. Antonio Ancona and anybody or company associates with Antonio Ancona does not take any responsibility for any installation of the vents unless Antonio Ancona is retained and paid to inspect and verify the specific vents and vent installation.



FUSION
Engineering

642 Cowpath Rd. No. 294
Lansdale, PA 19446
267-640-2758

P 001

December 5, 2013

Mr. Paul Logan
AARichards House Lifting and Construction
75 Manchester Ave
Keyport, NJ 07735

(FAX)

RE: Certification of Engineered Flood Openings (FEMA TB-1 August 2008)
Mumford Flood Vent

Mr. Logan:

I hereby certify that the Mumford Flood Vent, properly installed and sized in accordance with Federal Emergency Management Agency's (FEMA's) National Flood Program regulations is design to automatically equalize hydrostatic flood forces on exterior walls by allowing for entry and exit of floodwater during floods up to and including the base 100-year flood.

The calculations used to determine the area of the engineered opening are in accordance with American Society of Civil Engineers (ASCE) Flood Resistant Design and Construction (ASCE 24). The following formula from ASCE was utilized:

$$A_o = 0.033 [1/c] R A_e$$

Where:
 A_o = total net area of openings required (in²)
0.033 = coefficient corresponding to a factor of safety of 5.0 (in²*hr/ft³)
C = opening coefficient (.4 for rectangular, long axis horizontal)
R = worst case rate of rise and fall (ft/hr)
(5 ft/hr default per FEMA Tech Bulletin 1 Aug 2008)
 A_e = total enclosed area (ft²)

By solving for A_o , this office has calculated the allowable square footage coverage for one (1) Mumford Flood Vent with $A_o = 92 \text{ in}^2$. Each Mumford Flood Vent covers 223 ft² of enclosed area.

Installation Limits and Instructions:

- Units used in enclosed areas below otherwise elevated buildings, non-elevated attached and detached garages and certain non-elevated accessory structures located in flood hazard areas are to be used solely for parking of vehicles, building access or storage.
- Each enclosed area shall have at least two flood openings, installed on different sides of the enclosed area.
- The bottom of the flood openings shall be no more than one foot above the adjacent finished grade ground level.

23:20

12/12/2006

Cook & Vent (Mumford)

ENGINEERED FLOOD OPENINGS CALCULATIONS
(TO SATISFY REQUIREMENTS OF THE NATIONAL FLOOD INSURANCE PROGRAM)
(BASED ON F.E.M.A. TECHNICAL BULLETIN TB 1-93)

MUMFORD VENTS

FLOW CALCULATIONS

Required "Flow Rate" of a Flood Type Vent per F.E.M.A. Technical Bulletin TB1-93 under the heading "Openings in Foundation Walls for Buildings Located in Special Flood Hazard Areas." The bulletin states that 1 square foot of vent opening is required for 1 square foot of enclosed area inside the building. This requirement has a built-in Safety Factor of 5. The bulletin also sets a worst case rate of "Rise of Flood Waters" is 1" per minute.

The MUMFORD VENT net effective opening of 8.3/4" ht. x 79.3/4" width, or 92.8 square inches (see attached manufacturing drawing). The 92.8 square inches equates to 92 square feet of enclosed area it will protect. Calculating the rate of flow for the MUMFORD VENT @ 92 sq. ft. area at the rate of 1 inch per minute (F.E.M.A. set rate) equals 92.8 cu. ft. / min. or 57.34 gallons per min. through it.

MATHEMATICAL / THEORETICAL CALCULATION - MUMFORD VENT FLOOD FLOW

The water level we will assume for the flow calculation will be at a head height of 8" a full block height, and the area that the MUMFORD VENT occupies. Therefore we are assuming a full flood condition.

FORMULA: $P = \rho \times g \times h$ WHERE $P = 172 \times \rho \times g \times h$
 $\rho =$ Density of Water @ 50°F $h =$ Water Head (8" or .687')
 $g =$ Acceleration due to gravity (32.174 ft/s²) $v =$ Velocity of the water under a given head

Formula & values / F.E.M.A. except head of 8" (theory assumption)

$v = \sqrt{2 \times g \times h} = \sqrt{2 \times 32.174 \times 0.686} = 8.55 \text{ ft./sec.}$

FORMULA: FLOW RATE = $Q = A \times v \times K$
 $Q =$ FLOW RATE $A =$ Area of Opening (92.8 sq. in. or .644 sq. ft.) $v =$ Flow Velocity (8.55 / sec.)
 $K =$ Discharge Coefficient (0.2). As used in F.E.M.A. Technical Bulletin TB 1-93

$Q = .644 \text{ sq. ft.} \times 8.55 \text{ ft./sec.} \times 0.2 = 4.22082 \times 0.2 = .844164 \text{ cu. ft./sec.}$

This Flow Rate would equate to 84.4164 cu. ft. / sec x 60 sec = 5064.984 cu. ft. / min. A flow rate of this magnitude would equate to a flow of 387.9 gallons of water a minute through the 92.8 sq. in. MUMFORD VENT.

CONCLUSION: The MUMFORD VENT exceeds the requirements of the FEMA Technical Bulletin TB 1-93 by a large margin. Considering the 92.8 sq. ft. area limitation takes into account a safety factor of "5" and

0.2
0.2

0.2
0.2

BOOKS VENT (MUMFORD) VENT
ATTN: CT Flood Vent

VISCONI - 807 2nd Street, Union Beach
F.E.M.A. - Installation, Limitations and Instructions. (TB# - 93)

- 1) The Mumford Vent unit provides sufficient automatic equalization of hydrostatic pressure on walls and foundations of buildings located in flood hazard areas where the rate of rise is expected to be less than 5' per hour.
- 2) Units used in enclosed areas by low otherwise elevated buildings; non-elevated attached and detached garages; and certain non-elevated accessory structures located in flood hazard areas are to be used solely for parking of vehicles; building access or storage.
- 3) Each enclosed area shall have at least two flood openings, installed on different sides of the enclosed area. (In guardless of the flow rates and sq. ft. coverage.)
- 4) The bottom of the flood opening shall be no more than one foot above the adjacent finished grade ground level.
- 5) Installation must be in accordance with code and manufacturer's instructions.

MUMFORD VENT SYSTEM

- 1) The Mumford Vent is made to slide in to notched masonry sash blocks, and to be mounted into place on the face side only. (back-side must be free of mortar or any cement to allow the flood pane to drop out at time of flood waters.)
- 2) The Mumford Vent is also available for existing foundations. This unit body is the same but has two side flanges (1 1/2" - 2") welded to the frame. The unit is attached to the foundation with drilling 4 holes in the flanges and attaching with Tapcon masonry screws into the adjacent block. This same unit may be attached to wooden frame walls as well.
- 3) **NEVER REMOVE FOAM FLOPA-TON INSERT FROM THE DROP-OUT PANEL.** The foam is needed to lift the panel so it may pop out in a flood situation. It is not a winter insulation piece for an air vent. Reinforcing this panel renders the unit dysfunctional.
- 4) **THIS IS NOT AN "AIR VENT" UNIT !!** The holes in the panel are there to make the panel lighter, easier to float out of the frame in a flood. This unit has no "Air Vent" rating - it is for flood relief only.
- 5) The Mumford Vents are made from 16 gauge galvanized steel of different gauges depending on the size of the unit.
- 6) The unit may be painted after it is season exposed to the weather to allow the oils to evaporate so you have a paintable face. Prime the 1 st. coat - any exterior paint to finish the unit (or unit may be left as manufactured.)
- 7) Replacement Drop Out Panels are available if needed. Call Mumfords toll free @

Certification of Engineered Flood Openings

In accordance with NFIP, FEMA TB 1-08 and ASCE/SEI 24-05

I hereby certify that the Mumford Sheet Metal Works, LLC flood vent Model No. "NCNFIP Flood Vent" is designed in accordance with the requirements of the NFIP Flood Insurance Manual, 2011 to provide automatic equalization of hydrostatic flood forces by allowing for the entry and exit of floodwaters, when properly installed as set forth below. This certification follows the design requirements and specifications established in FEMA Technical Bulletin 1-08 "Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings in Special Flood Hazard Areas", and the ASCE Standard for "Flood Resistant Design and Construction" (ASCE/SEI 24-05).

Design Characteristics

Section 2.6.2.2 of ASCE 24 provides an equation to determine the required net area of engineered openings (A_0) for a given enclosed area (A_e). This equation is based on the hydraulic formula for the flow rate across sharp edge orifices. I have utilized this equation to calculate the flow rate through the main frame opening. These values are based on the following assumptions:

- In absence of reliable data, the rates of rise and all have been assumed to be $R = 5$ feet/hour;
- The (maximum) difference between the exterior and interior floodwater levels have been assumed with one foot during base flood conditions;
- A factor of safety of 5 have been assumed, which is consistent with design practices related to protection of life and property;
- The net area of opening (A_n) is $10.25" \times 7.125"$ (101.53 in²);
- Opening Coefficient (C) = 0.40 from ASCE Table 2-3 "rectangular, long axis horizontal, short axis vertical, unobstructed during design flood";
- Floatable screen raises and self-removes from frame during design flood.
- $A_e = 1\text{ft}^2$ total enclosed area.

$$A_0 = 0.033 / C \times R \times A_e = 0.033 / 0.40 \times 5 \times 1 = .4125 \text{ in}^2 \text{ per ft}^2$$

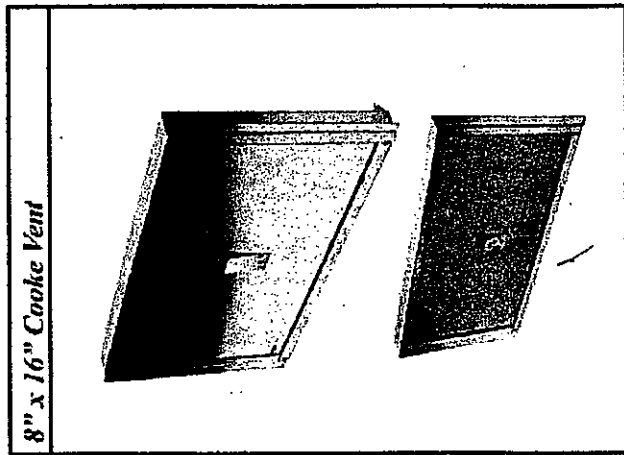
$$\text{Square Feet of enclosed area each vent covers} = A_n / A_0 = 101.53 / 0.4125 = 246.14 \text{ ft}^2$$

Installation Requirements and Limitations.

This certification will be voided if the following installation requirements and limitations are not enforced:

- There shall be a minimum of two openings on different sides of each enclosed area;
- The bottom of each required opening shall be no more than 1ft above the adjacent ground level (interior or exterior);
- No temporary (e.g. during cold weather) or permanent solid cover may be placed into or over the flood vent that would block the automatic entry or exit of floodwaters at any time;
- Where analysis indicates rates of rise and fall greater than 5 ft/hr, the total enclosed area shall be reduced accordingly to account for the higher rates of rise and fall.

Identification of Building and Installed Flood Vents



1. Antonio Ancona, do hereby certify that the 8"x16" Flood Vents by Cooke & Associates, the 8"x16" Solid Door Face and Perforated Door Face with Styro Backing are in compliance with Section 26.12, SEI/ASCE 24-98, Flood Resistant Design and Construction Standard. This standard requires flood vents to open and prevent unbalanced water elevation to be limited to 12" for the expected maximum flood rate of rise and fall.

The subject flood vents, when open, will provide 98 square inches of opening. Each flood vent will provide 238 sq.ft. of flood protection for a maximum rate of rise and fall of 5 ft/hr. Further it is noted that the use of the vents is subject to the following limitations:

1. The bottom of the vent shall be no higher than 12" from finish grade.
2. There shall be appropriate number of vents per foundation as needed to supply 1 square inch of net free space for 2,424 square feet of enclosed space for maximum rate of rise and fall of 5 ft/hr. The flood protection area per inch of opening can be increased, per engineering calculation, for rate of rise and fall less than 5 ft/hr, and the flood area per inch of opening shall be reduced, per engineering calculations, if the rate of rise and fall is greater than 5 ft/hr.
3. The flood gates shall not be used for crawl space ventilation.
4. And, the vents shall not be restricted as to the operation of the drop out panel, this panel must be able to drop out freely at all times. A vent visual inspection is recommended after the initial installation and completion of all construction work around the vents to ensure that the vent panel is free to drop out.

Sincerely,



Antonio Ancona
 Antonio Ancona, P.E., Ph.D.
 Maryland P.E. Lic. No. 10094

AX
 MODER 01 1230
 MODER 101
 COOKES RUCKO \$63.00
 COOKES RUCKO

Engineered Flood Openings Certificate To satisfy requirements of the National Flood Insurance Program

This certification must be submitted to, and kept on file by, the local jurisdiction's permit authority. A copy should be retained by the owner to demonstrate compliance in order to receive flood insurance rating.

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*Required Fields

Signature: *A. Ancona* (Antonio Ancona, P.E.)

Title: Consulting Engineer

Type of License: Professional Engineer

License Number MD PE 10894

*Project Name _____

*Project Address _____

*Date Submitted _____



Installation Limitations and Instructions

1. The Cooke Vent unit provides sufficient automatic equalization of hydrostatic pressure on walls and foundations of buildings located in flood hazard areas where the rate of rise is expected to be less than or approximately 5 feet per hour.
2. Enclosed areas below otherwise elevated buildings, non-elevated attached and detached garages, and certain non-elevated accessory structures located in flood hazard areas are to be used solely for parking of vehicles, building access, or storage.