

ELEVATION CERTIFICATE

Important: Follow the instructions on pages 1–9.

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

SECTION A – PROPERTY INFORMATION				FOR INSURANCE COMPANY USE	
A1. Building Owner's Name Brenda Skaggs				Policy Number:	
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 60 Rebecca Lane				Company NAIC Number:	
City Belle		State West Virginia		ZIP Code 25015	
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) Parcel of land on Witcher Creek (DB 2810, P 340 & Cabin Creek District TM 26, P 10)					
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) Residential					
A5. Latitude/Longitude: Lat. 38.228370N. Long. 81.511701W. 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 6					
A8. For a building with a crawlspace or enclosure(s):					
a) Square footage of crawlspace or enclosure(s) 2432.00 sq ft					
b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade 4					
c) Total net area of flood openings in A8.b 3400.00 sq in					
d) Engineered flood openings? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
A9. For a building with an attached garage:					
a) Square footage of attached garage N/A sq ft					
b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade 0					
c) Total net area of flood openings in A9.b 0.00 sq in					
d) Engineered flood openings? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION					
B1. NFIP Community Name & Community Number Kanawha County, WV / 540070			B2. County Name Kanawha		B3. State West Virginia
B4. Map/Panel Number 54039C0582	B5. Suffix E	B6. FIRM Index Date 02-06-2008	B7. FIRM Panel Effective/ Revised Date 02-06-2008	B8. Flood Zone(s) AE	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth) 608.7 NAVD88
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9: <input checked="" type="checkbox"/> FIS Profile <input 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					

ELEVATION CERTIFICATE

OMB No. 1660-0008  
Expiration Date: November 30, 2022

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. 60 Rebecca Lane			Policy Number:	
City Belle	State West Virginia	ZIP Code 25015	Company NAIC Number	
SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)				
C1. Building elevations are based on: <input type="checkbox"/> Construction Drawings* <input type="checkbox"/> Building Under Construction* <input checked="" type="checkbox"/> 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: <u>Survey grade GPS on site</u> Vertical Datum: <u>NAVD88</u> Indicate elevation datum used for the elevations in items a) through h) below. <input type="checkbox"/> NGVD 1929 <input checked="" type="checkbox"/> NAVD 1988 <input type="checkbox"/> 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)	606.0	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters	
b) Top of the next higher floor	610.8	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters	
c) Bottom of the lowest horizontal structural member (V Zones only)	N/A	<input type="checkbox"/> feet	<input type="checkbox"/> meters	
d) Attached garage (top of slab)	N/A	<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)	611.1	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters	
f) Lowest adjacent (finished) grade next to building (LAG)	606.0	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters	
g) Highest adjacent (finished) grade next to building (HAG)	607.7	<input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters	
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	606.1	<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.				
Were latitude and longitude in Section A provided by a licensed land surveyor? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Check here if attachments.				
Certifier's Name William R. Gunnoe, RPS		License Number 801		
Title Registered Professional Surveyor				
Company Name Gunnoe Surveying & Mapping				
Address P.O. Box 1172				
City Clendenin	State West Virginia	ZIP Code 25045		
Signature 	Date 04-19-2023	Telephone (304) 548-5324	Ext.	
Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.				
Comments (including type of equipment and location, per C2(e), if applicable) Item C2e - air unit set on platform at downstream side of subject dwelling. Subject is a proposed mobile home set on piers with solid perimeter skirting, having a total of four flood gates taken as 850 square inches each. New home has been set in accordance with the height requirements of the Kanawha County Floodplain Ordinance.				

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City Belle	State West Virginia	ZIP Code 25015	Company NAIC Number	

SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED)  
FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zones AO and A (without BFE), complete Items E1–E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1–E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).

a) Top of bottom floor (including basement, crawlspace, or enclosure) is

☐ feet ☐ meters ☐ above or ☐ below the HAG.

b) Top of bottom floor (including basement, crawlspace, or enclosure) is

☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is

☐ feet ☐ meters ☐ above or ☐ below the HAG.

E3. Attached garage (top of slab) is

☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is

☐ feet ☐ meters ☐ above or ☐ below the HAG.

E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F – PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.

Property Owner or Owner's Authorized Representative's Name

Address	City	State	ZIP Code
Signature	Date	Telephone	

Comments

☐ Check here if attachments.



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. 60 Rebecca Lane			Policy Number:	
City Belle	State West Virginia	ZIP Code 25015	Company NAIC Number	
SECTION G – COMMUNITY INFORMATION (OPTIONAL)				
The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8–G10. In Puerto Rico only, enter meters.				
G1. <input type="checkbox"/> The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)				
G2. <input type="checkbox"/> A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.				
G3. <input type="checkbox"/> The following information (Items G4–G10) is provided for community floodplain management purposes.				
G4. Permit Number		G5. Date Permit Issued		G6. Date Certificate of Compliance/Occupancy Issued
G7. This permit has been issued for: <input type="checkbox"/> New Construction <input type="checkbox"/> Substantial Improvement				
G8. Elevation of as-built lowest floor (including basement) of the building: _____ <input type="checkbox"/> feet <input type="checkbox"/> meters Datum _____				
G9. BFE or (in Zone AO) depth of flooding at the building site: _____ <input type="checkbox"/> feet <input type="checkbox"/> meters Datum _____				
G10. Community's design flood elevation: _____ <input type="checkbox"/> feet <input type="checkbox"/> meters Datum _____				
Local Official's Name		Title		
Community Name		Telephone		
Signature		Date		
Comments (including type of equipment and location, per C2(e), if applicable)				
<div><input type="checkbox"/> Check here if attachments.</div>				

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE
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City Belle	State West Virginia	ZIP Code 25015	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.



Photo One

Photo One Caption From right front perspective

Clear Photo One



Photo Two

Photo Two Caption From left rear perspective

Clear Photo Two



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City Belle	State West Virginia	ZIP Code 25015	Company NAIC Number

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.



Photo Three

Photo Three Caption From left rear perspective

Clear Photo Three



Photo Four

Photo Four Caption From left front perspective

Clear Photo Four



# Certification of Engineered Flood Openings

In accordance with the Code of Federal Regulations for the National Flood Insurance Program

I hereby certify that the **Crawl Space Door Systems flood vents 816CS, 1220CS, 1232CS, 1616CS, 1624CS, 1632CS, 2032CS, 2424CS, and 2436CS** are **designed** in accordance with the requirements of the Code of Federal Regulations for the National Flood Insurance Program (NFIP) **to provide automatic equalization of hydrostatic flood forces by allowing for the entry and exit of floodwaters**, when properly installed and sized as set forth below. Vent opening measurements were measured and certified by Mr. Christopher Mark Loney, Virginia P.E. NO. 029000. Detailed calculations were prepared as outlined in "Review of certification of Engineered Flood Openings," prepared by Dr. Georg Reichard, Associate Professor of Building Construction, Virginia Tech (available upon request from Crawl Space Door Systems, Inc. [billy@crawlspacedoors.com](mailto:billy@crawlspacedoors.com))

## Design Characteristics

Section 2.6.2.2 of ASCE/SEI 24-05 provides an equation to determine the required net area of engineered openings ( $A_o$ ) for a given enclosed area ( $A_e$ ). This equation is based on the hydraulic formula for the flow rate across sharp edged orifices. I have utilized this equation to calculate 1) the restricted flow rate through the main frame opening in case the louver is blown out during a flood event; 2) the flow rate through the individual openings between louver blades; and 3) the flow rate through projected openings between louver blades following hydraulic short-tube theory. The maximum total enclosed area ( $A_e$ ) that can be serviced by a single vent has then been determined by utilizing the lowest flow rate of the three assessed scenarios for each vent and is listed in Table 1. These values are based on the following assumptions:

- In absence of reliable data, the rates of rise and fall have been assumed at a minimum rate of 5 feet/hour;
- The (maximum) difference between the exterior and interior floodwater levels shall not exceed 1 foot during base flood conditions;
- A factor of safety of 5 has been assumed, which is consistent with design practices related to protection of life and property;
- The net area of openings ( $A_o$ ) as provided by the manufacturer.

*)	Model	H x W [in]	$A_o$ [in <sup>2</sup> ]	$A_e$ [ft <sup>2</sup> ]
<input type="checkbox"/>	816CS	8 x 16	105	<b>205</b>
<input type="checkbox"/>	1220CS	12 x 20	235	<b>500</b>
<input type="checkbox"/>	1232CS	12 x 32	305	<b>645</b>
<input type="checkbox"/>	1616CS	16 x 16	180	<b>395</b>
<input type="checkbox"/>	1624CS	16 x 24	310	<b>670</b>
<input type="checkbox"/>	1632CS	16 x 32	405	<b>835</b>
<input type="checkbox"/>	2032CS	20 x 32	630	<b>1240</b>
<input type="checkbox"/>	2424CS	24 x 24	570	<b>1230</b>
<input type="checkbox"/>	2436CS	24 x 36	850	<b>1765</b>


## 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 subject to flooding;
- The bottom of all openings shall be no higher than one foot above the higher of the interior or exterior grade that is immediately under each opening;
- 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 data or analyses indicate more rapid rates of rise and fall, the required number of openings shall be increased to account for those different conditions. The number or size of the openings may be decreased if data or analyses indicate rates of rise and fall are less than 5 feet per hour.

**Table 1** Maximum total enclosed area ( $A_e$ ) that can be serviced by each individual model based on the given net area of engineered openings ( $A_o$ )

## Certifying Design Professional

Name	<b>Roger K. Randolph</b>	Title	<b>P.E.</b>
Company	<b>Randolph Engineering Co., Inc.</b>		
Address	<b>10401 Teays Valley Road, Scott Depot, WV 25560</b>		
License	<b>West Virginia</b>	License No.	<b>6246</b>
Signature:			Date: <b>5/21/19</b>



## Identification of the Building and Installed Flood Vents (By Others)

The flood vent models marked in Table 1\*) are being installed at the following building:

Building Address